United States Environmental Protection Agency Region 10, Office of Air, Waste and Toxics, AWT-150 1200 Sixth Avenue, Suite 900 Seattle, Washington 98101-3140	Permit Number: R10TNSR00200 Issued: April 19, 2016 Effective: April 19, 2016 AFS Plant I.D. Number: 53-077-00043

Permit Analysis

Minor New Source Review Permit

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Neucor, Incorporated

Yakama Reservation
White Swan, Washington

Purpose of Permit and Permit Analysis

Title 40 of the Code of Federal Regulations, §§ 49.151-165, establish a federal new source review program in Indian Country that establishes (a) a preconstruction permitting program for new and modified minor stationary sources and minor modifications at major sources to meet the requirements of Section 110(a)(2)(C) of the Clean Air Act; (b) a mechanism for otherwise major sources (including major sources of hazardous air pollutants) to voluntarily accept restrictions on potential to emit to become synthetic minor sources; and (c) a mechanism for case-by-case maximum achievable control technology determinations for those major sources of HAPs subject to such determinations under Section 112(g)(2) of the Clean Air Act.

This document, the permit analysis, fulfills the requirements of 40 CFR §§ 49.157(a)(3), (4) and (5) by describing the reviewing authority's analysis of the application. Unlike the minor new source review permit, this Permit Analysis is not legally enforceable. The Permittee is obligated to comply with the terms of the permit. Any errors or omissions in the summaries provided here do not excuse the Permittee from the requirements of the permit.

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1. Introduction and Summary

On August 17, 2015, EPA Region 10 received an application from Neucor requesting authorization to construct a new source and requesting synthetic minor limits on HAPs. The application was determined incomplete on October 2, 2015. After receiving additional information, Region 10 requested a new application more accurately reflecting Neucor's proposal for operating the facility. A new application was submitted on January 29, 2016. Neucor is proposing to reactivate a medium density fiberboard-manufacturing facility formerly owned and operated by Jeld-Wen, Inc., that was shut down in 2009. Region 10 determined that the reactivation was subject to permitting as a new source. EPA also determined that the equipment that was previously subject to the Plywood and Composite Wood Products Maximum Achievable Control Technology standard, 40 CFR Part 63, Subpart DDDD, remains subject to that MACT standard under EPA's Once-in-Always-in Policy notwithstanding the 2009 shutdown of the facility. See Memorandum from John Seitz, Director, Office of Air Quality Planning and Standards, Potential to Emit for MACT Standards—Guidance on Timing Issues, May 16, 1995. Neucor's request for synthetic minor limits on HAPs will allow the facility to be treated as a minor HAP source for future MACT standards.

The Neucor facility is made up of two identical production lines that can operate independent of each other and produce MDF panels. The plant will be reactivated in three stages. In Stage 1, only line 1 will operate, the line 1 dryer will be uncontrolled and the wood-fired boiler (BLR1) will not operate. If certain permit conditions are met, in Stages 2 and 3, all emission units will operate and the dryers will be controlled by baghouses.

Region 10 relied upon information provided in Neucor's permit application and supplementary information provided by Neucor to draft the permit.

2. Source Information

The Neucor facility is located in White Swan, Washington, within the exterior boundaries of the 1855 Yakama Reservation and is in Indian Country as defined in 40 CFR Part 49. Neucor, a privately owned company and the facility operator, is leasing the facility from White Swan Manufacturing, LLC, which is owned by West Mountain View International, LLC, except for the two press lines that are being leased from Jeld-Wen.

Neucor plans to purchase wood chips and shavings from which it will produce panel cores manufactured using a dry-process MDF process. Neucor will manufacture hot-pressed panel cores in a variety of panel depths. Unprocessed (raw) wood furnish is received from trailers at the facility's truck dump. Furnish received at the truck dump is screened for size to remove large pieces of wood and debris that cannot be used in the process. Acceptable furnish is carried by auger and bucket elevator and distributed to three large raw material storage silos. One silo will contain dry shavings, one will contain green chips and the third will contain recycled material. This will facilitate the operating strategy described in Section 4 of this document. Furnish from the raw material storage silos is further screened prior to refining into optimum fiber size. Undersized material is rejected and pneumatically transferred to the waste truck bin for use off-site.

Acceptable furnish is refined in a thermo-mechanical refiner. Emulsified wax will be added to the fiber as it exits the refiner to add water resistance to the core panel. After refining, the fiber is dried to 10-14% moisture content in a steam-heated tube dryer and stored in a fiber bin. Fiber from the bin is metered to a mechanical blender where methylene diphenyl diisocyanate (pMDI) resin is added and mixed with the fiber. Fiber mats are formed through a single-head vacuum forming line, then stacked into a loader and loaded into a multi-platen hot press. Once all platens of the press are full, the press forces the resinated fiber into molds under heat and pressure. Core panels will be pressed to a density of approximately 45-50 pounds per cubic foot and an average board thickness of 0.135". After the resin in the panel has fully cured, the press opens and the core panels are unloaded. Panels are visually inspected and sorted according to their depth and pattern orientation. Defective panel cores are hogged for reuse as raw material or sent to the waste truck bin for offsite use. Acceptable panel cores will be trimmed to a final size in a two-pass saw. Waste from the saw will be pneumatically conveyed to baghouses, and then to the raw material bins. Core panels will then be sanded to a specified depth on a two-head sander. Sander dust will be pneumatically transferred to the waste truck bin cyclone and bin for off-site use.

The air pollution emission units and control devices that exist at Neucor are listed and described in Table 2-1. As mentioned above, there are two identical production lines that can operate independent of each other. All refiner material and exhaust feeds directly into the dryer. Material handling, sanding and sawing activities have been separated into emission units based upon the shared control devices. When only production line 1 is operating, the sander is the only operating activity in emission unit MR2S.

Table 2-1: Emission Units and Control Devices

EU ID	Emission Unit Description	Control Device[1]
BLR1 - Wood-Fired Boiler #1	Wellons brand, 47.3 MMBtu/hr, wood waste fuel; installed 1984	Wellons brand multiclone and electrostatic precipitator
BLR2 - Fuel Oil-Fired Boiler #2	Donlee brand, 37.8 MMBtu/hr, No. 2 diesel; installed 1997	None
BLR3 - Fuel Oil-Fired Boiler #3	Cleaver Brooks brand, 8.4 MMBtu/hr, No. 2 diesel fuel; installed 2005	None
D1 & D2 - Dryers #1 and #2	Refiners and indirectly steam heated Westec brand dryers on lines 1 and 2; 70 ODT/day each	None for stage 1; baghouses D1 and D2 for stages 2 and 3.
LF1 & LF2 - Blenders/Formers #1 and #2	Blenders and COE brand vacuum line formers on lines 1 and 2	Carter Day brand, model 156 RF10 baghouses F1 and F2, respectively
P1 & P2 - Presses #1 and #2	Washington Iron Works brand board presses for lines 1 and 2; 53.3 msf/day 3/4" basis each	None
C1 & C2 - Board Coolers #1 and #2	Board coolers for lines 1 and 2	None
MHS - Material Handling & Sawing	Material handling to the raw material silos, truck bin cyclone, fines cyclone, plug feeder	Carter Day brand, model 375 RF10 baghouse BHS

EU ID	Emission Unit Description	Control Device[1]
	cyclones (lines 1 & 2) and from the two-pass saw	
MR1 - Material Recycling Line 1	Material handling to chip bin cyclone (line 1) and recycle cyclone (line 1)	Clarks brand, model 57-20 baghouse BH1
MR2S - Material Recycling Line 2 and Sanding	Material handling to recycle cyclone (line 2) and from the sander; when only line 1 is operating only the sander in this unit operates	Clarks brand, model 57-20 baghouse BH2
MNFA - Miscellaneous Non-Fugitive Activities	Miscellaneous non-fugitive activities generate emissions inside buildings and are not specifically described in other emission units	Inside buildings and partial buildings; the three-walled truck dump has a panel filter to collect and control dust
MFA - Miscellaneous Fugitive Activities	Miscellaneous fugitive activities generate emissions outside buildings and are not specifically described in other emission units.	None
DT - Diesel Tank	No. 2 diesel fuel storage; 10,000 gallons	None
FP - Fire Pump Engine	Detroit Diesel brand, model 6061A (671); 188 horsepower at 1750 rpm; 11.5 gallons/hour diesel fuel; 1.495 mmBtu/hr	None
PT - Plant Traffic	Plant traffic by vehicles on paved and unpaved roads generate fugitive dust emissions.	None

[1] Listed control devices are required.

3. Applicability

3.1 Potential to Emit

Region 10 reviewed Neucor's inventories and has documented the facility potential to emit in Region 10's Emissions Evaluation in Appendix A to this Permit Analysis. In some instances, Region 10 revised the emission estimates provided by Neucor to more accurately reflect the potential to emit of the facility. A summary of Neucor's non-fugitive PTE (except for HAPs) is presented in Table 3-1 below. Note that fugitive emissions are not included for non-HAP emissions because, for sawmills, fugitive emissions are not used to determine new source review program applicability.

Table 3-1 - Stage 1 Potential to Emit, tons per year

Emission Unit	CO	NOx	PM	PM10	PM2.5	SO2	VOC
BLR2	5.8	23.2	2.3	3.8	3.8	8.2	0.2
BLR3	1.3	5.3	0.5	0.9	0.9	1.9	0.1
D1	1.4		46.5	43.1	26.8		26.6

Emission Unit	CO	NOx	PM	PM10	PM2.5	SO2	VOC
F1			0.04	0.04	0.04		7.0
P1	0.3	0.3	1.8	3.4	3.4		2.9
C1			0.5	0.04	0.04		1.5
MHS (line 1)			0.2	0.2	0.2		7.8
MR1			0.00002	0.00002	0.00002		0.4
MR2S (line 1)			0.03	0.03	0.03		0.01
FP	0.1	0.3	0.01	0.01	0.01	0.03	0.02
Total	8.9	29.1	51.9	51.5	35.3	10.1	40.9

Table 3-2 - Stages 2 & 3 Potential to Emit, tons per year

Emission Unit	CO	NOx	PM	PM10	PM2.5	SO2	VOC
BLR1	124.0	72.5	8.1	11.6	11.6	5.2	3.5
BLR2	5.8	23.2	2.3	3.8	3.8	8.2	0.2
BLR3	1.3	5.3	0.5	0.9	0.9	1.9	0.1
D1	1.4		0.5	0.5	0.5		26.6
D2	1.4		0.5	0.5	0.5		26.6
F1			0.04	0.04	0.04		7.0
F2			0.04	0.04	0.04		7.0
P1	0.3	0.3	1.8	3.4	3.4		2.9
P2	0.3	0.3	1.8	3.4	3.4		2.9
C1			0.5	0.04	0.04		1.5
C2			0.5	0.04	0.04		1.5
MHS (line 1)			0.2	0.2	0.2		7.8
MHS (line 2)			0.2	0.2	0.2		7.8
MR1			0.00002	0.00002	0.00002		0.4
MR2S (line 1)			0.03	0.03	0.03		0.01
MR2S			0.1	0.1	0.1		1.1
FP	0.1	0.3	0.01	0.01	0.01	0.03	0.02
Total	135.0	101.9	17.2	24.9	24.9	15.3	85.6

[1] Fugitive emissions are not included in this table because fugitives are not used in NSR applicability determinations for this source type (see Section 4.1). For fugitive emission estimates, see Appendix A.

For miscellaneous emission generating activities that occur inside buildings, emissions are estimated to have been reduced by 80% due to being inside a building. Region 10 believes this is a conservative assumption. Additional sources of VOC and HAP, both fugitive and non-fugitive, likely exist, but emission factors for those sources are not available. For instance, it is known that logs, lumber and byproducts lose turpentine over time, and turpentine content relates to VOC emissions, and some portion of the VOC emissions tend to be HAPs.

3.2 Minor NSR Applicability Thresholds

The threshold for major source permitting (e.g., prevention of significant deterioration for attainment areas and unclassifiable areas) is 250 tpy (see 40 CFR § 52.21). New sources with potential emissions less than the PSD major source threshold but greater than the thresholds in Table 3-3 (see 40 CFR § 49.153, Table 1) are required to get a minor NSR permit under the Federal Minor New Source Review Program in Indian Country, 40 CFR §§ 49.151 to .161, prior to commencing construction. South central Washington, including the Yakama Reservation, is currently considered to be in attainment or unclassifiable for PM10, PM2.5 and CO.

Table 3-3 – Minor NSR Thresholds[1], tons per year

Regulated NSR Pollutant	Nonattainment Areas	Attainment Areas
Carbon monoxide (CO)	5	10
Nitrogen oxides (NO_X)	5	10
Sulfur dioxide (SO_2)	5	10
Volatile Organic Compounds (VOC)	2	5
PM	5	10
PM_{10}	1	5
$PM_{2.5}$	0.6	3
Lead	0.1	0.1
Fluorides	NA	1
Sulfuric acid mist	NA	2
Hydrogen sulfide (H_2S)	NA	2
Total reduced sulfur (including H_2S)	NA	2
Reduced sulfur compounds (including H_2S)	NA	2
Municipal waste combustor emissions	NA	2
Municipal solid waste landfill emissions (measured as nonmethane organic compounds)	NA	10

[1] If part of a Tribe's area of Indian country is designated as attainment and another part as nonattainment, the applicable threshold for a proposed source or modification is determined based on the designation where the source would be located. If the source straddles the two areas, the more stringent thresholds apply.

3.3 Applicability Determination

Based upon Neucor's PTE in Table 3-2 (reflecting all stages of the project) and in more detail in Appendix A, Neucor is subject to mNSR for these pollutants: CO, NOx, PM, PM10, PM2.5, SO2 and VOC. All other pollutants are below the mNSR applicability threshold.

In addition to applying for a mNSR permit for the construction of a new source under 40 CFR § 49.154, Neucor is also requesting a synthetic minor limit for HAPs under 40 CFR § 49.158. After the permit is issued, Neucor's PTE for HAPs will be below the major source thresholds of 25 tpy for total HAPs and 10 tpy for any single HAP.

4. Additional Analyses

<u>EPA Trust Responsibility</u>. As part of the EPA Region 10's direct federal implementation and oversight responsibilities, Region 10 has a trust responsibility to each of the 271 federally recognized Indian tribes within the Pacific Northwest and Alaska. The trust responsibility stems

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from various legal authorities including the U.S. Constitution, Treaties, statutes, executive orders, historical relations with Indian tribes and, in this case, the Treaty of June 9, 1855. In general terms, the EPA is charged with considering the interest of tribes in planning and decision making processes. Each office within the EPA is mandated to establish procedures for regular and meaningful consultation and collaboration with Indian tribal governments in the development of EPA decisions that have tribal implications. Region 10's Office of Air, Waste and Toxics has contacted the Tribe to invite consultation on this minor NSR permit project and has maintained ongoing communications with Tribal environmental staff throughout the permitting process.

Endangered Species Act. Under this act, the EPA is obligated to consider the impact that a federal project may have on listed species or critical habitats. This permit will ensure that the new operation will not cause or contribute to a violation of a NAAQS (see Appendix B to this Permit Analysis). It is the EPA's conclusion that the issuance of this minor NSR permit will not affect a listed species or critical habitat because it does not authorize any changes to the physical footprint of the existing facility. Therefore, no additional analysis and no additional requirements will be added to this permit for the ESA reasons. The EPA's no-effect determination concludes the EPA's obligations under Section 7 of the ESA. For more information about the EPA's obligations, see the Endangered Species Consultation Handbook: Procedures for Conducting Consultation and Conference Activities under Section 7 of the ESA, published by the FWS and NMFS (March 1998, Figure 1).

National Historic Preservation Act. As noted earlier, the issuance of this mNSR permit does not authorize any changes to the physical footprint of the existing facility. This permit will ensure that the new operation will not cause or contribute to a violation of a NAAQS (see Appendix B to this Permit Analysis). No changes to the facility are expected as a result of this permit action. Consequently, no adverse effects are expected, and further review under the NHPA is not necessary.

Environmental Justice Policy - Under Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,* signed on February 11, 1994, the EPA is directed, to the greatest extent practicable and permitted by law, to make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States. This permit will ensure that the new operation will not cause or contribute to a violation of a NAAQS (see Appendix B to this Permit Analysis). EPA therefore concludes that this permit action will not have a disproportionately high or adverse human health effects on nearby communities. Region 10 will work with the Tribal environmental staff to determine the best methods for engaging the local communities.

Title V Operating Permit Program. Title V of the CAA and the implementing regulation found in 40 CFR part 71 require Title V major sources (as well as a selection of non-major sources) of air pollution to obtain operating permits. A source is major for Title V purposes if it has the potential to emit 100 tons per year or more of any air pollutant subject to regulation, 25 tons per year or more of HAPs (in aggregate) or 10 tons per year or more of any single HAP (see 40 CFR § 71.2). Neucor's facility is a Title V major source because it has the potential to emit more than 100 tons per year CO and NOx and is also considered major because it is subject to the major source PCWP MACT standard. Neucor is required to submit an application for a Title V permit within 12 months after beginning operation.

New Source Performance Standards. Boiler BLR2 is subject to New Source Performance Standard 40 CFR Part 60, Subpart Dc, because it has a heat input capacity greater than 10 but less than 100 mmBtu/hr and was installed in 1997. Boiler BLR 1 was installed before the Subpart Dc applicability date of 1989, and boiler BLR3 is below the size threshold in Subpart Dc. Neither boiler BLR1 or BLR3 is therefore subject to NSPS Dc.

National Emission Standards for Hazardous Air Pollutants. The Neucor facility was previously owned by Jeld-Wen and was operated as a major source of HAPs at the time of the first compliance date of the PCWP MACT,[1] 40 CFR Part 63, Subpart DDDD. EPA Region 10 therefore determined that the Neucor facility remains subject to PCWP MACT as an existing affected source.

This permit creates synthetic minor limits for HAPs, such that the facility can be considered as a minor source of HAPs for any MACT standard for which the first date a source must comply with an emission limitation or other substantive regulatory requirement under the standard has not yet occurred. 40 CFR, Subpart JJJJJJ, NESHAP for Industrial, Commercial, and Institutional Boilers, is an area source NESHAP that applies to all three boilers at the Neucor facility. This NESHAP establishes tune-up and energy assessment requirements, but does not include emission limits that impact PTE estimations.

Section 111(d) and Section 129 Regulations. There are no CAA, Section 111(d) or 129 regulations that apply to the type of emission units at Neucor.

Federal Air Rules for Reservations. On April 8, 2005, the EPA promulgated a Federal Implementation Plan for Reservations in Idaho, Oregon and Washington, commonly referred to as the Federal Air Rules for Reservations. The EPA published the FARR rules that generally apply to Indian Reservations in Region 10 in 40 CFR §§ 49.121 to 49.139. The FARR rules that specifically apply on the Yakama Reservation (Sections 123, 124, 125, 126, 129, 130, 131, 135, 137, 138 and 139) are codified at 40 CFR §§ 49.11101 to 49.11110. FARR requirements that create limits on potential to emit have been taken into consideration in Region 10's Emissions Evaluation in Appendix A.

Acid Rain Program. Title IV of the CAA created a SO_2 and NO_X reduction program found in 40 CFR Part 72. The program applies to any facility that includes one or more "affected units" that produce power. Neucor's boilers are not a "unit" as defined in 40 CFR § 72.2 because the boilers do not produce power.

5. Permit Content

The permit content requirements can be found in 40 CFR § 49.155. The permit is organized into the following five sections:

Permit Section 1: Source Information and Emission Units
Permit Section 2: General Requirements
Permit Section 3: Emission Limitations and Work Practice Requirements

[1] MACT standards are a subset of NESHAP standards.

Permit Section 4: Monitoring and Recordkeeping Requirements
Permit Section 5: Reporting Requirements

Each permit condition in the permit is explained below. Specific analyses that were performed in development of the permit are described or referenced.

Permit Section 1 – Source Information and Emission Units

This permit section contains a brief description of the facility and a list of emission units. A more detailed description of the facility can be found in Section 2 of this Permit Analysis. Note that the control devices listed and described in the Table 1-1 of the permit are required by this permit.

Permit Section 2 – General Requirements

Permit Condition 2.1 is the severability clause required by 40 CFR § 49.155(a)(6).

Permit Conditions 2.2 through 2.8 are specific general provisions required by 40 CFR § 49.155(a)(7).

Permit Condition 2.9 is the permit invalidation provision required by 40 CFR § 49.155(b).

Permit Condition 2.10 requires the permittee to comply with all other applicable requirements as required as required by 40 CFR § 49.151(d)(4).

Permit Condition 2.11 requires the permittee to construct and operate the source in accordance with the permit as required by 40 CFR § 49.151(d)(2).

Permit Section 3 – Emission Limits and Work Practice Requirements

In setting emission limits in the permit, Region 10 evaluated whether an air quality impact analysis was needed, as required in 40 CFR 49.154(d) and performed a control technology review as required in 40 CFR 49.154(c). Details about the Air Quality Impact Analysis evaluation and Control Technology Review are in Appendices B and C, respectively. The emission limits and work practice control requirements in Permit Section 3 reflect the results of those analyses.

Permit Condition 3.1 requires the installation of baghouses to control particulate matter emissions from the refiners and tube dryers on both production lines before the production line 2 begins operating. This is expected to reduce potential ambient impacts caused when both production lines are operating. Neucor proposed this in their application based on concerns about the existing PM2.5 ambient air quality levels being measured during winter and fall stagnation periods in Toppenish, Washington. Screening modeling performed by Region 10 (see Appendix B) indicates that impacts caused by only one production line operating is not expected to cause or contribute to a violation of the NAAQS. Neucor expects to have the baghouses installed by late 2016.

Permit Condition 3.2 requires that not only the baghouses be installed on the dryer emissions (see Permit Condition 3.1), but also requires either boiler BLR1 be subject to a tighter emission limit or a full AQIA prior to the operation of boiler BLR1. Region 10's air quality assessment determined that if the boiler emissions are limited to 1.23 pph (0.026 lb/mmBtu) there would be no need for an AQIA. Neucor is allowed to test the boiler to determine whether it can meet that limit and thereby avoid performing the full AQIA, but with special restrictions described in permit condition 4.13.4 which will ensure the NAAQS are protected during testing. The AQIA is

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necessary to demonstrate that the operation of boiler BLR1 (while operating at the emission level specific in Permit Table 3-2) will not cause or contribute to a violation of the 24-hour PM2.5 NAAQS. See Appendix B for more details about the air quality assessment. The screening modeling performed by Region 10 indicates that, at the boiler BLR1 emissions level in Permit Table 3-2, a more refined analysis is needed to assess the impact caused by boiler BLR1 prior to its operation.

Permit Conditions 3.3 and 3.4 are the synthetic minor limits for HAPs, limiting emissions to less than the major source thresholds of 25 tpy (for all HAPs combined) and 10 tpy for any single HAP. The emissions factors that must be used to calculate HAP emissions for purposes of demonstrating compliance with the synthetic minor HAP limits are included in Permit Table 3-1. Actual production data must be tracked and recorded for use in the compliance calculations. Because HCl emissions from wood-fired boilers have been known to vary greatly depending on the fuel source, quarterly chloride sampling is required in Permit Condition 4.6. HAP emission testing is required for the dryers, presses and former F1 (see Permit Conditions 4.11 and 4.12).

Permit Condition 3.5 limits the amount of sulfur in the fuel oil used to fuel Boiler BLR2 and BLR3 and the fire pump engine. Neucor proposed to use fuel oil with either 0.5% or 0.05% sulfur content. The higher sulfur content meets the FARR requirements that apply to all three emission units as well as NSPS Dc, which applies to BLR2. However, Region 10's air quality assessment (see Appendix B) indicates use of the higher sulfur-content fuel might result in ambient sulfate levels that are a concern. Region 10 is therefore requiring the use of lower sulfur-content fuel.

Permit Condition 3.6 presents production-based emission limits for each emission unit that emits regulated NSR pollutants that are above the mNSR program thresholds (see Section 3 of this Permit Analysis) as required in 40 CFR 49.154(c). These emission limits were developed as part of Region 10's Emission Evaluation (see Appendix A). By determining numerical production-based emission factors (that double as limits) that take into consideration Neucor's operations and assure compliance with all of the applicable requirements in the FARR, NSPS and NESHAP, these emission limits meet 40 CFR 49.154(c)(2) and (4). Compliance with the limits is determined through testing using test methods in Permit Table 3-4, if/when required. Region 10 can approve alternative methods if needed. Region 10 focused actual compliance testing requirements on the limits that tended to be some combination of higher emissions, uncontrolled emissions or more variable emissions, taking into consideration the testing that will be required by the PCWP MACT. See the explanations for Permit Conditions 4.10 (press P1 particulate testing) and 4.13 (boiler BLR1 particulate testing). Testing is required for Press P1 because by Stage 2 and 3, it will be one of the highest emitters, so the information the limit is based upon can be improved with onsite testing. Testing is also required for Boiler BLR1 to confirm that the ESP control device is fully functional after sitting idle for 6-7 years.

Permit Condition 3.7 limits the hourly emissions of PM2.5 from each emission unit based on the emission rates that will be used in the AQIA. Before operating boiler BLR1, Neucor must demonstrate that the boiler can meet a much lower limit than proposed or perform a full AQIA to ensure the emissions from the facility will not cause a NAAQS problem when the boiler is operating. If an AQIA is not performed because the boiler either meets a lower emission limit or is never operated, these emission limits do not go into effect. Compliance will be based on emission testing.

Permit Condition 3.8 presents the annual limits for each emission unit that emits a regulated NSR pollutant subject to the mNSR program (see Section 3 for that list) as required by 40 CFR 49.155(a)(2). These limits were determined in Region 10's Emissions Evaluation in Appendix A and reflect the production-based emission limits in Permit Conditions 3-6 and the operation limits in Permit Condition 3.7. Compliance is determined multiplying actual recorded production data by the production-based emission limits in Permit Condition 3-6.

Permit Condition 3.9 is a general requirement that requires good air pollution control practices for minimizing emissions.

Permit Condition 3.10 restricts the types of fuel that can be combusted in boiler BLR1 to the fuel proposed in Neucor's application.

Permit Condition 3.11 limits the fire pump engine operation to 100 hours per year as proposed in Neucor's application. This allows the engine to be operated periodically to ensure its operational capability in case of emergency.

Permit Condition 3.12 specifies operational conditions that Neucor is relying on to limit HAP and VOC emissions from the drying and pressing operations. Compliance testing required by the PCWP MACT will confirm Neucor's assumptions regarding the amount of emissions reduction that will result from these operational adjustments. Neucor will be testing the dryers and presses for MACT compliance within 180 days after beginning operation of each production line. If testing results in different operational constraints or the need for additional HAP controls, Region 10 will evaluate whether the mNSR permit must be reopened and revised.

Permit Condition 3.13 limits visible emissions to reflect the level of PM control expected throughout the plant. This limit is consistent with the FARR.

Permit Condition 3.14 requires reasonable precautions be taken to prevent fugitive emissions. This is a general requirement that is consistent with the FARR.

Permit Section 4 – Monitoring and Recordkeeping Requirements

Permit Condition 4.1 is a general requirement to install equipment or establish a procedure that can reliably measure and record production, operations and required monitoring at the facility. The information that is gathered using this equipment is used in many ways to confirm compliance with the permit, including compliance with HAP synthetic minor limits, annual limits, operation limits and reporting emissions and fees under the FARR and Title V. Steam pressure can be used to track the preheater furnish temperature if the procedure is documented and updated as appropriate.

Permit Condition 4.2 requires the calculation HAP emissions to determine compliance.

Permit Condition 4.3 is a general recordkeeping requirement as required in 40 CFR 49.155(a)(4).

Permit Condition 4.4 is a general recordkeeping requirement as required in 40 CFR 49.155(a)(4), enhanced with similar language from 40 CFR Part 63. This condition establishes the time frame for retaining records and details the information that is subject to this retention requirement.

Permit Condition 4.5 requires documentation or sampling to confirm compliance with the fuel oil sulfur content limit and is consistent with the FARR in 40 CFR 49.130.

Permit Condition 4.6 requires quarterly chloride sampling of the fuel used in boiler BLR1, so an emission factor specific to the fuel used by Nuecor can be determined. Sampling will continue for 18 months. At that time, which will be before Neucor's Title V permit is issued, Region 10 can re-evaluate the need for additional sampling.

Permit Conditions 4.7, 4.8 and 4.9 are moisture and temperature monitoring requirements to verify the operational limits in Permit Condition 3.12.

Permit Condition 4.10 requires emission testing of PM2.5 for press P1. The PM2.5 results can be used to confirm compliance with the limits in Permit Condition 3.6 and confirm the value used in the PM2.5 AQIA required in Permit Condition 3.2.2.2. Region 10 believes press P1 PM2.5 testing adequately represents press P2 based on the information available.

Permit Condition 4.11 requires source testing for HAP from the dryers and presses. The testing for HAP is required to be consistent with the requirements of the PCWP MACT in 40 CFR 63.2262 and Table 4 of 40 CFR Part 63, Subpart DDDD. The dryers and presses are subject to the requirements of the PCWP MACT as existing sources. The HAP testing required by Condition 4.11 is for purposes of determining compliance with the synthetic minor limit on HAPs established in this permit. This permit specifies that the PCWP MACT testing requirements are to be used for HAP testing under Condition 4.11 to avoid the potential for duplicative or conflicting testing requirements. Testing will verify the HAP emission factors and can be used to confirm compliance with the HAP limits in Permit Conditions 3.3 and 3.4.

Permit Condition 4.12 requires emission testing of HAP for former F1. Region 10 is not confident in the HAP emission factors for the formers. Some estimates are very high; some are very low. Testing will verify the emission factor and can be used to confirm compliance with the HAP limits in Permit Conditions 3.3 and 3.4. Region 10 believes former F1 testing adequately represents former F2 based on the information available.

Permit Condition 4.13 requires testing of PM2.5 from boiler BLR1. In operational Stages 2 and 3, boiler BLR1 will be the biggest contributor of PM2.5. Test results can be used to verify compliance with the limits in Permit Condition 3.6 and can be used to confirm the value used in the PM2.5 AQIA required in Permit Condition 3.2.2. Process parameters must be recorded during testing to document operational conditions during testing. The permit provides an option to test boiler BLR1 before completing the AQIA. In that case, boiler BLR1 must meet an interim emission limit, must be tested during the second calendar quarter of the year (in any year) and must be limited to 10 days of operation for pre-test startup and testing.

Permit Condition 4.14 specifies general requirements that any emission testing must follow, from submittal of a test plan to operational restrictions during testing to reporting test results.

Permit Conditions 4.15 through 4.21 require periodic walk-throughs to check for opacity and fugitive emissions. This has become a typical requirement in permits issued by Region10 and helps to ensure the plant is being maintained and operated consistent with the permit.

Permit Conditions 4.22 through 4.26 require the development of a fugitive dust plan consistent with the FARR.

Permit Section 5 – Reporting Requirements

Permit Condition 5.1 requires reporting when the baghouses are installed.

Permit Condition 5.2 requires annual HAP emission and deviation summary reporting. The report can be timed with either the annual FARR registration report or the annual Title V emission report. All three of the annual reports will be on the same timing once Neucor's Title V permit is issued.

Permit Condition 5.3 requires promptly reporting deviations as required in 40 CFR 49.155(a)(5). The examples of deviations are consistent with wording in Region 10-issued Title V permits.

Permit Condition 5.4 is the general requirement to report testing results.

Permit Condition 5.5 specifies where to submit reports, noting that a copy should always be sent to the Tribal environmental office.

6. Public Participation

6.1 Public Notice and Comment

As required in 40 CFR § 49.157, all draft mNSR permits must be publicly noticed and made available for public comment for 30 days as follows:

40 CFR § 49.157(a) requires the reviewing authority to make available for public inspection at the appropriate EPA Regional Office and in at least one location in the area affected by the source, such as the Tribal environmental office or a local library, the application, additional information requested, a copy of the draft permit and the reviewing authority's analysis of the application including the control technology review and analysis of the effect on ambient air quality.

40 CFR § 49.157(b)(1) requires the reviewing authority to provide adequate public notice to ensure that the affected community and the general public have reasonable access to the application and draft permit information, as set out in 49.157(b)(1)(i) and (ii). The public notice must provide an opportunity for public comment and notice of a public hearing, if any, on the draft permit. The notice will be posted on Region 10's website at http://yosemite.epa.gov/R10/homepage.nsf/Information/R10PN/.

40 CFR § 49.157(b)(2) lists the information that must be included in the public notice.

40 CFR § 49.157(c) explains how to submit comments and what the requirements are for holding a public hearing.

6.2 Response to Public Comments and Permit Issuance

The public comment period closed on April 19, 2016. No comments were received, so the permit is effective immediately. As required in 40 CFR § 49.159, Region 10 will notify the permittee and provide public notice of the final decision.

7. Abbreviations and Acronyms

§	Section
bf	Board feet
Btu	British thermal units
CAA	Clean Air Act [42 U.S.C. section 7401 et seq.]
CFR	Code of Federal Regulations

CO	Carbon monoxide
EJ	Environmental Justice
EPA	United States Environmental Protection Agency (also U.S. EPA)
ESA	Endangered Species Act
ESP	Electrostatic Precipitator
EU	Emission Unit
FARR	Federal Air Rules for Reservations
gal	Gallon(s)
HAP	Hazardous air pollutant
hr	Hour
lb	Pound (lbs = pounds)
m	Thousand
MACT	Maximum Achievable Control Technology (40 CFR Part 63)
MDI	Methylene diphenyl diisocyanate (resin)
mm	Million
mNSR	Minor New Source Review program
NAAQS	National Ambient Air Quality Standard
NESHAP	National Emission Standards for Hazardous Air Pollutants (40 CFR Parts 61 and 63)
NHPA	National Historical Preservation Act
NOx	Nitrogen oxides
NSPS	New Source Performance Standard
ODT	Oven dried ton
PM	Particulate matter
PM_{10}	Particulate matter less than or equal to 10 microns in aerodynamic diameter
$PM_{2.5}$	Particulate matter less than or equal to 2.5 microns in aerodynamic diameter
PSD	Prevention of significant deterioration
psig	Pounds per square inch gauge
PTE	Potential to emit
Region 10	U.S. EPA, Region 10
sf	Square feet
SIC	Standard Industrial Code
SO_2	Sulfur dioxide
tpy	Tons per year
VOC	Volatile organic compound

Appendix A

Emissions Evaluation

EPA Analysis of Application for
Minor NSR Construction Permit and
Synthetic Minor Source Permit

Neucor, Inc
White Swan, Washington
R10TNSR00200

Appendix A: Potential Emissions Inventory

Summary of Facility Non-HAP Potential to Emit

Potential to Emit, (tons per year)

Non-Fugitive Emissions[1], (tons per year)

Emission Unit →	Biomass Boiler	No. 2 Fuel Oil Boilers	Fiber Refining, Drying and Recovery	Blenders and Formers	Presses	Board Coolers	Material Handling	Wood Residue Drops	Fire Pump Engine	Diesel Tank	Non-Fugitive Subtotal
EU ID's →	BLR-1	BLR2 & BLR3	D1 & D2	F1 & F2	P1 & P2	C1 & C2	MH1, MR1, MR2S	WRD	FPE	DT	
Carbon Monoxide (CO)	124.3	7.1	2.8		0.7				0.1		135
Lead (Pb)	0.01	0.002							0.000002		0
Nitrogen Oxides (NO_X)	72.5	28.5			0.6				0.3		102
Particulate (PM)[2]	8.1	2.8	1.0	0.08	3.5	1.1	0.6	0.1	0.01		17
Inhalable Coarse Particulate (PM_{10})	11.6	4.7	1.0	0.08	6.8	0.1	0.6	0.05	0.01		25
Fine Particulate ($PM_{2.5}$)	11.6	4.7	1.0	0.08	6.8	0.1	0.6	0.01	0.01		25
Sulfur Dioxide (SO_2)	5.2	10.1							0.03		15
Volatile Organic Compounds (VOC)	3.5	0.3	53.2	2.6	5.8	3.0	17.1		0.02	0.01	86
Greenhouse Gas (CO_2e)	43,781	33,117							11		76,909

Fugitive Emissions, (tons per year)

Emission Unit →	Biomass Boiler	No. 2 Fuel Oil Boilers	Fiber Refining, Drying and Recovery	Blenders and Formers	Presses	Board Coolers	Material Handling	Wood Residue Drops	Fire Pump Engine	Diesel Tank	Fugitive Subtotal
EU ID's →	BLR-1	BLR2 & BLR3	D1 & D2	F1 & F2	P1 & P2	C1 & C2	MH1, MR1, MR2S	WRD	FPE	DT	
Carbon Monoxide (CO)											0
Lead (Pb)											0
Nitrogen Oxides (NO_X)											0
Particulate (PM)[2]											0
Respirable Particulate (PM_{10})											0
Fine Particulate ($PM_{2.5}$)											0
Sulfur Dioxide (SO_2)											0
Volatile Organic Compounds (VOC)											0
Greenhouse Gas (CO_2e)											0

All Emissions[3], (tons per year)

Emission Unit →	Biomass Boiler	No. 2 Fuel Oil Boilers	Fiber Refining, Drying and Recovery	Blenders and Formers	Presses	Board Coolers	Material Handling	Wood Residue Drops	Fire Pump Engine	Diesel Tank	Plantwide PTE
EU ID's →	BLR-1	BLR2 & BLR3	D1 & D2	F1 & F2	P1 & P2	C1 & C2	MH1, MR1, MR2S	WRD	FPE	DT	
Carbon Monoxide (CO)	124.3	7.1	2.8		0.7				0.1		135.0
Lead (Pb)	0.01	0.002							0.000002		0.0
Nitrogen Oxides (NO_X)	72.5	28.5			0.6				0.3		101.9
Particulate (PM)[2]	8.1	2.8	1.0	0.08	3.5	1.1	0.6	0.1	0.01		17.2
Respirable Particulate (PM_{10})	11.6	4.7	1.0	0.08	6.8	0.1	0.6	0.05	0.01		24.9
Fine Particulate ($PM_{2.5}$)	11.6	4.7	1.0	0.08	6.8	0.1	0.6	0.01	0.01		24.8
Sulfur Dioxide (SO_2)	5.2	10.1							0.03		15.3
Volatile Organic Compounds (VOC)	3.5	0.3	53.2	2.6	5.8	3.0	17.1		0.02	0.01	85.6
Greenhouse Gas (CO_2e)	43,781	33,117							11		76,909

Notes:

[1] Only non-fugitive emissions are considered for this facility in determining Title V applicability given that it is a plywood mill and not one of the 27 listed source categories required to consider fugitive emissions. See definition of "major source" at 40 CFR § 71.2.

[2] PM is not a pollutant considered in determining whether a source is subject to the requirement to obtain a Title V permit, however, PM emissions are considered in determining whether a facility/project is a major PSD source/modification and whether a source is subject to CAM.

[3] The "All Emissions" table sums the values in the "Non-Fugitive Emissions" and "Fugitive Emissions" tables.

Summary of Facility HAP Potential to Emit

Potential to Emit, (tons per year)

Emission Unit →	Biomass Boiler	No. 2 Fuel Oil Boilers	Fiber Refining, Drying and Recovery	Blenders and Formers	Presses	Board Coolers	Material Handling	Fire Pump Engine	Single HAP Plantwide Totals
EU ID's →	BLR1	BLR2 & BLR3	D1 & D2	F1 & F2	P1 & P2	C1 & C2	MH1, MR1, MR2S	FPE	
Trace Metal Compounds									
Antimony Compounds	1.6E-03	5.69E-06							1.6E-03
Arsenic Compounds (including arsine)	4.6E-03	4.27E-06							4.6E-03
Beryllium Compounds	2.3E-04	4.27E-06							2.3E-04
Cadmium Compounds	8.5E-04	4.27E-06							8.5E-04
Chromium Compounds (including hexavalent)	4.4E-03								4.4E-03
Cobalt Compounds	1.4E-03								1.4E-03
Lead Compounds (not elemental lead)	9.9E-03	1.28E-05							1.0E-02
Manganese Compounds	3.3E-01	8.54E-06							0.3
Mercury Compounds	7.3E-04	4.27E-06							7.3E-04
Nickel Compounds	6.8E-03	4.27E-06							6.8E-03
Phophorus	5.6E-03								5.6E-03
Selenium Compounds	5.8E-04	2.14E-05							6.0E-04
Other Inorganic Compounds									
Chlorine	1.6E-01								0.2
Hydrochloric acid (hydrogen chloride)	3.9E+00								3.9
Organic Compounds									
Acetaldehyde	1.7E-01		0.0E+00	0.0E+00	0.0E+00	1.9E-02		9.49E-05	0.2
Acetophenone	6.6E-07								6.6E-07
Acrolein	8.3E-01		0.0E+00	0.0E+00	0.0E+00	4.3E-03		1.14E-05	0.8
Benzene	8.7E-01	3.05E-04						1.15E-04	0.9
Bis(2-ethylhexyl)phthalate (DEHP)	9.7E-06								9.7E-06
1,3-Butadiene								4.84E-06	4.8E-06
Carbon tetrachloride	9.3E-03								9.3E-03
Chlorobenzene	6.8E-03								6.8E-03
Chloroform	5.8E-03								5.8E-03
Dibenzofurans[2]	3.9E-07								3.9E-07
2,4-Dinitrophenol	3.7E-05								3.7E-05
Ethyl benzene	6.4E-03	9.05E-05							6.5E-03
Ethylene dichloride (1,2-Dichloroethane)	6.0E-03								6.0E-03
Formaldehyde	9.1E-01	4.70E-02	5.0E-01	1.1E+00	5.8E+00	8.2E-01	3.19E-01	1.46E-04	9.5
Methanol	3.1E-01		7.1E+00	1.6E+00	0.0E+00	4.9E-01	1.62E+00		11.1
Methyl bromide (Bromomethane)	3.11E-03								3.1E-03
Methyl chloride (Chloromethane)	4.77E-03								4.8E-03
Methyl chloroform (1,1,1-trichloroethane)	6.42E-03	3.36E-04							6.8E-03
Methyl ethyl ketone						2.1E-03			2.1E-03
Methylene chloride (Dichloromethane)	6.0E-02								0.1
Methylene diphenyl diisocyanate				0.0E+00	3.0E-04				3.0E-04
Naphthalene[2]	2.0E-02	1.61E-03						1.05E-05	2.2E-02
4-Nitrophenol	2.3E-05								2.3E-05
Pentachlorophenol	1.1E-05								1.1E-05
Phenol	1.1E-02		0.0E+00	0.0E+00	0.0E+00		3.00E-01		0.3
Polychlorinated biphenyls (PCB)	1.7E-06								1.7E-06
Polycyclic Organic Matter (POM)	2.6E-02	1.69E-03						2.02E-05	2.8E-02
Propionaldehyde	1.3E-02		0.0E+00	0.0E+00	0.0E+00				0.0
Propylene dichloride (1,2-Dichloropropane)	6.8E-03								6.8E-03
Styrene	3.9E-01								0.4
2,3,7,8-Tetrachlorodibenzo-p-dioxin[1]	1.8E-09								1.8E-09
Tetrachloroethylene (tetrachloroethene)	7.9E-03								7.9E-03
Toluene	1.9E-01	8.83E-03						5.06E-05	0.2
Trichloroethylene (Trichloroethene)	6.2E-03								6.2E-03
2,4,6-Trichlorophenol	4.6E-06								4.6E-06
Vinyl chloride	3.7E-03								3.7E-03
Xylenes (inlc isomers and mixtures)	5.2E-03	1.55E-04						3.53E-05	5.4E-03
TOTAL[2]	8.3	0.06	7.6	2.6	5.8	1.3	2.2	0.0005	

Predicted Highest Plantwide Single HAP	11.1	tons per year, methanol
Predicted Plantwide HAP Total	28.1	tons per year, based on summing estimates

[1] designates a HAP that is subject individually to the 10 tpy major source threshold, but that is also one of several polycyclic organic matter (POM) compounds that, in aggregate, are subject to the same 10 tpy major source threshold.

[2] Because dibenzofurans, naphthalene and 2,3,7,8-Tetrachlorodibenzo-p-dioxin (one of several dibenzodioxins) are accounted for individually and in the calculation of POM EF, their individual contribution here is discounted so as to avoid double-counting.

Appendix A: Potential Emissions Inventory

Summary of Emission Factors, Capacities, TPY and PPH Values That May Be Used In Permit As Limitations.

		production based emission limits						
Emission Unit	Units	CO	NOx	PM	PM10	PM2.5	SO2	VOC
BLR2	lb/mgal	5	20	2	3.3	3.3	7.1	0.2
BLR3	lb/mgal	5	20	2	3.3	3.3	7.1	0.2
D1	lb/ODT	0.11		3.6	3.4	2.1		2.1
F1	lb/ODT			0.003	0.003	0.003		0.1
P1	lb/msf	0.03	0.03	0.2	0.4	0.4		0.3
C1	lb/msf			0.05	0.004	0.004		0.2
MHS	lb/ODT			0.02	0.02	0.02		0.5
MR1	lb/ODT			0.00002	0.00002	0.00002		0.5
MR2S (line 1)	lb/ODT			0.1	0.1	0.1		0.03
FP	lb/mmBtu	1.0	4.4	0.2	0.2	0.2	0.5	0.4

		Hourly	Annual
Emission Unit	Units	Capacity	Capacity
BLR2	mgal	0.265	2321.4
BLR3	mgal	0.060	525.6
D1	ODT	2.917	25550.0
F1	ODT	2.917	25550.0
P1	msf	2.221	19457.5
C1	msf	2.221	19457.5
MHS	ODT	3.529	30915.5
MR1	ODT	0.204	1788.5
MR2S	ODT	0.088	766.5
FP	mmBtu	1.316	11528.2

Emission Unit	Units	CO	NOx	PM	PM10	PM2.5	SO2	VOC
BLR1	lb/mmBtu	0.6	0.4	0.04	0.06	0.06	0.03	0.02
BLR2	lb/mgal	5	20	2	3.3	3.3	7.1	0.2
BLR3	lb/mgal	5	20	2	3.3	3.3	7.1	0.2
D1	lb/ODT	0.1		0.04	0.04	0.04		2.1
D2	lb/ODT	0.1		0.04	0.04	0.04		2.1
F1	lb/ODT			0.003	0.003	0.003		0.1
F2	lb/ODT			0.003	0.003	0.003		0.1
P1	lb/msf	0.03	0.03	0.2	0.4	0.4		0.3
P2	lb/msf	0.03	0.03	0.2	0.4	0.4		0.3
C1	lb/msf			0.05	0.004	0.004		0.2
C2	lb/msf			0.05	0.004	0.004		0.2
MHS (line 1)	lb/ODT			0.02	0.02	0.02		0.5
MHS (line 2)	lb/ODT			0.02	0.02	0.02		0.5
MR1	lb/ODT			0.00002	0.00002	0.00002		0.5
MR2S (line 1)	lb/ODT			0.1	0.1	0.1		0.03
MR2S	lb/ODT			0.1	0.1	0.1		0.7
FP	lb/mmBtu	1.0	4.4	0.2	0.2	0.2	0.5	0.4

		Hourly	Annual
Emission Unit	Units	Capacity	Capacity
BLR1	mmBtu	47.3	414348.0
BLR2	mgal	0.265	2321.4
BLR3	mgal	0.060	525.6
D1	ODT	2.917	25550.0
D2	ODT	2.917	25550.0
F1	ODT	2.917	25550.0
F2	ODT	2.917	25550.0
P1	msf	2.221	19457.5
P2	msf	2.221	19457.5
C1	msf	2.221	19457.5
C2	msf	2.221	19457.5
MHS (line 1)	ODT	3.529	30915.5
MHS (line 2)	ODT	3.529	30915.5
MR1	ODT	0.204	1788.5
MR2S (line 1)	ODT	0.088	766.5
MR2S	ODT	0.379	3321.5
FP	mmBtu	1.316	11528.2

Highlighted values are unique to Stage 2/3; other values are the same as in Stage 1.

	TPY						
Emission Unit	CO	NOx	PM	PM10	PM2.5	SO2	VOC
BLR2	5.8	23.2	2.3	3.8	3.8	8.2	0.2
BLR3	1.3	5.3	0.5	0.9	0.9	1.9	0.1
D1	1.4		46.4	43.1	26.8		26.6
F1			0.04	0.04	0.04		1.3
P1	0.3	0.3	1.8	3.4	3.4		2.9
C1			0.5	0.04	0.04		1.5
MHS			0.2	0.2	0.2		7.8
MR1			0.00002	0.00002	0.00002		0.4
MR2S			0.03	0.03	0.03		0.01
FP	0.1	0.3	0.01	0.01	0.01	0.03	0.02
	8.9	29.1	51.9	51.5	35.3	10.1	40.9

	PPH
Emission Unit	PM2.5
BLR2	0.87
BLR3	0.20
D1	6.12
F1	0.01
P1	0.78
C1	0.01
MHS	0.05
MR1	0.000004
MR2S	0.01
FP	0.003

	TPY						
Emission Unit	CO	NOx	PM	PM10	PM2.5	SO2	VOC
BLR1	124.3	72.5	8.1	11.6	11.6	5.2	3.5
BLR2	5.8	23.2	2.3	3.8	3.8	8.2	0.2
BLR3	1.3	5.3	0.5	0.9	0.9	1.9	0.1
D1	1.4		0.5	0.5	0.5		26.6
D2	1.4		0.5	0.5	0.5		26.6
F1			0.04	0.04	0.04		1.3
F2			0.04	0.04	0.04		1.3
P1	0.3	0.3	1.8	3.4	3.4		2.9
P2	0.3	0.3	1.8	3.4	3.4		2.9
C1			0.5	0.04	0.04		1.5
C2			0.5	0.04	0.04		1.5
MHS (line 1)			0.2	0.2	0.2		7.8
MHS (line 2)			0.2	0.2	0.2		7.8
MR1			0.00002	0.00002	0.00002		0.4
MR2S (line 1)			0.03	0.03	0.03		0.01
MR2S			0.1	0.1	0.1		1.1
FP	0.1	0.3	0.01	0.01	0.01	0.03	0.02
	135.0	101.9	17.2	24.9	24.9	15.3	85.6

	PPH
Emission Unit	PM2.5
BLR1	2.65
BLR2	0.87
BLR3	0.20
D1	0.12
D2	0.12
F1	0.01
F2	0.01
P1	0.78
P2	0.78
C1	0.01
C2	0.01
MHS (line 1)	0.05
MHS (line 2)	0.05
MR1	0.000004
MR2S (line 1)	0.01
MR2S	0.03
FP	0.003

Non-HAP Potential to Emit

Emission Unit:	**BLR1**	
Description:	Wellons boiler	
Control Device:	Multiclone and electrostatic precipitator	
Fuel:	Biomass	
Design Maximum Heat Input Capcity:	47.3	MMBtu/hr
Maximum Steam Production:		mlb steam/hr
Operation:	8760	hr/yr

NON-FUGITIVE EMISSIONS

Potential to Emit, (tons per year)

Criteria Pollutant Emissions	EF (lb/MMBtu)	ORL EF (lb/MMBtu)	PTE (tpy)	ORL PTE (tpy)	EF Reference
Carbon Monoxide (CO)	0.6		124.3		1 - CO Option 1 because no emission limits apply. No CO control devices employed.
Lead (Pb)	0.000048		0.01		1 - Pb Option 1 because no emission limits apply. No Pb control devices employed.
Nitrogen Oxides (NO_X)	0.409	0.35	84.7	72.5	1 - NO_X A realistically conservative assumption is that 70% of the wood residue is dry and 30% of the wood residue is wet. The dry wood combustion EF is 0.49 lb/MMBtu, and the wet wood combustion EF is 0.22 lb/MMBtu. (0.7)(0.49 lb/MMBtu) + (0.3)(0.22 lb/MMBtu) = 0.409 lb/MMBtu. No emission limits apply. No NO_X control devices employed. ORL EF (uncontrolled) based upon November 1996 and June 1997 testing of "Boiler G" at Jeld-Wen Klamath Falls, OR facility. Summary of stack test reports not provided, and application does not illustrate how "Boiler G" is similar to BLR1.
Particulate (PM)	0.412	0.039	85.4	8.1	1 - PM Option 5 because boiler is subject to Federal Air Rules for Reservartions (FARR). See 40 CFR § 49.125(d)(2) for 0.2 gr/dscf @ 7% O_2 PM emission limit. PM emissions are the "filterable" fraction quantified via EPA Reference Method 5. PM emissions do not include the "condensible" fraction. See EPA final rulemaking in the October 25, 2012 Federal Register, pages 65107-65119, at http://www.gpo.gov/fdsys/pkg/FR-2012-10-25/pdf/2012-25978.pdf. ORL EF based upon unit-specific June 29, 1988 testing and applying 90% control efficiency. Summary of stack test report not provided, and application does not provide explanation of how 90% control efficiency will be achieved beyond stating that ESP will be operated.
Inhalable Coarse Particulate (PM_{10})	0.429	0.056	88.9	11.6	1 - PM_{10} Option 5 because boiler is subject to FARR PM limit of 0.2 gr/dscf @ 7% O_2 (assume all PM_{10}) and condensible fraction is 0.017 lb/MMBtu according to AP-42. ORL EF = PM EF + AP-42's Table 1.6-1 condensible fraction.
Fine Particulate ($PM_{2.5}$)	0.429	0.056	88.9	11.6	1 - PM_{10} Option 5 because boiler is subject to FARR PM limit of 0.2 gr/dscf @ 7% O_2 (assume all PM_{10}) and condensible fraction is 0.017 lb/MMBtu according to AP-42. ORL EF = PM EF + AP-42's Table 1.6-1 condensible fraction.
Sulfur Dioxide (SO_2)	0.069	0.025	14.3	5.2	1 - SO_2 Option 5. Because Option 1's FARR combustion source stack 500 ppm SO_2 emission limit is more stringent than Option 2's FARR solid fuel sulfur limit of 2% by weight (dry), Option 2 is not further considered. For Option 1, a sulfur content in the wood of 0.5% by weight (dry) would be necessary along with 100% conversion to SO_2 to generate 500 ppm SO_2 concentration in the stack. Because neither are reasonable worst-case assumptions, Option 1 is not further considered. Because Option 6 is simply an average of values derived from stack test results, Option 6 is not further considered. For Options 3, 4 and 5, all assume a reasonable worst-case sulfur content in the wood of 0.2% by weight (dry). The difference between Options 3, 4 and 5 rests with the sulfur-to-SO_2 assumed conversion rate. Option 3 reflects 100% conversion, Option 4 represents 10% conversion and Option 5 represents 15% conversion. Option 5 represents a reasonable worst-case estimation of PTE. ORL EF (uncontrolled) based upon AP-42's Table 1.6-2. EF is not calculated based upon a particular sulfur content of the fuel as is the case for liquid-fueled boilers.
Volatile Organic Compounds (VOC)	0.017		3.5		1 - VOC Option 1 because no emission limits apply. No VOC control devices employed.

Greenhouse Gas Emissions (CO_2 Equivalent)	EF (lb/MMBtu)		PTE (tpy)		EF Reference
Carbon Dioxide (CO_2)	206.8	-	42,844	-	1 - CO_2 Option 2 because the GHG Reporting Rule (40 CFR 98) is considered the primary reference for estimating GHG emissions when preparing or processing permit applications.
Methane (CH_4)	1.764	-	365.5	-	1 - CH_4 Option 2 because the GHG Reporting Rule (40 CFR 98) is considered the primary reference for estimating GHG emissions when preparing or processing permit applications.
Nitrous Oxide (N_2O)	2.759	-	571.6	-	1 - N_2O Option 2 because the GHG Reporting Rule (40 CFR 98) is considered the primary reference for estimating GHG emissions when preparing or processing permit applications.
TOTAL			43,781		

EF Reference	Description
1	EPA Region 10 Non-HAP Potential to Emit Emission Factors for Biomass Boilers Located in Pacific Northwest Indian Country, May 8, 2014. See http://www3.epa.gov/region10/pdf/air/technical/bbnonhappteef_memo.pdf

HAP Potential to Emit

Emission Unit: **BLR1**
Description: Wellons boiler
Control Device: Electrostatic precipitator
Fuel: Biomass
Design Maximum Heat Input Capcity: 47.3 MMBtu/hr
Maximum Steam Production: mlb steam/hr
Operation: 8760 hr/yr

Potential to Emit, (tons per year)

Hazardous Air Pollutants	EF (lb/MMBtu)	PTE (tpy)	EF Reference
Trace Metal Compounds			
Antimony Compounds	7.9E-06	1.64E-03	1
Arsenic Compounds (including arsine)	2.2E-05	4.56E-03	
Beryllium Compounds	1.1E-06	2.28E-04	
Cadmium Compounds	4.1E-06	8.49E-04	
Chromium Compounds (including hexavalent)	2.1E-05	4.35E-03	
Cobalt Compounds	6.5E-06	1.35E-03	
Lead Compounds (not elemental lead)	4.8E-05	9.94E-03	
Manganese Compounds	1.6E-03	3.31E-01	
Mercury Compounds	3.5E-06	7.25E-04	
Nickel Compounds	3.3E-05	6.84E-03	
Phosphorus	2.7E-05	5.59E-03	
Selenium Compounds	2.8E-06	5.80E-04	
Other Inorganic Compounds			
Chlorine	7.9E-04	1.64E-01	1
Hydrochloric acid (hydrogen chloride)	1.9E-02	3.94E+00	
Organic Compounds			
Acetaldehyde	8.3E-04	1.72E-01	1
Acetophenone	3.2E-09	6.63E-07	
Acrolein	4.0E-03	8.29E-01	
Benzene	4.2E-03	8.70E-01	
Bis(2-ethylhexyl)phthalate (DEHP)	4.7E-08	9.74E-06	
Carbon tetrachloride	4.5E-05	9.32E-03	
Chlorobenzene	3.3E-05	6.84E-03	
Chloroform	2.8E-05	5.80E-03	
Dibenzofurans[2]	1.87E-09	3.87E-07	
2,4-Dinitrophenol	1.8E-07	3.73E-05	
Ethyl benzene	3.1E-05	6.42E-03	
Ethylene dichloride (1,2-Dichloroethane)	2.9E-05	6.01E-03	
Formaldehyde	4.4E-03	9.12E-01	
Methanol	1.5E-03	3.11E-01	2
Methyl bromide (Bromomethane)	1.5E-05	3.11E-03	1
Methyl chloride (Chloromethane)	2.3E-05	4.77E-03	
Methyl chloroform (1,1,1-trichloroethane)	3.1E-05	6.42E-03	
Methylene chloride (Dichloromethane)	2.9E-04	6.01E-02	
Naphthalene[1]	9.7E-05	2.01E-02	
4-Nitrophenol	1.1E-07	2.28E-05	
Pentachlorophenol	5.1E-08	1.06E-05	
Phenol	5.1E-05	1.06E-02	
Polychlorinated biphenyls (PCB)	8.15E-09	1.69E-06	
Polycyclic Organic Matter (POM)	1.27E-04	2.63E-02	
Propionaldehyde	6.1E-05	1.26E-02	
Propylene dichloride (1,2-Dichloropropane)	3.3E-05	6.84E-03	
Styrene	1.9E-03	3.94E-01	
2,3,7,8-Tetrachlorodibenzo-p-dioxin[1]	8.6E-12	1.78E-09	
Tetrachloroethylene (tetrachloroethene)	3.8E-05	7.87E-03	
Toluene	9.2E-04	1.91E-01	
Trichloroethylene (Trichloroethene)	3.0E-05	6.22E-03	
2,4,6-Trichlorophenol	2.2E-08	4.56E-06	
Vinyl chloride	1.8E-05	3.73E-03	
Xylenes (inlc isomers and mixtures)	2.5E-05	5.18E-03	
TOTAL[2]	0.04023	8.3	

[1] designates a HAP that is subject individually to the 10 tpy major source threshold, but that is also one of several polycyclic organic matter (POM) compounds that, in aggregate, are subject to the same 10 tpy major source threshold.

[2] Because dibenzofurans, naphthalene and 2,3,7,8-Tetrachlorodibenzo-p-dioxin (one of several dibenzodioxins) are accounted for individually and in the calculation of POM EF, their individual contribution here is discounted so as to avoid double-counting.

EF Reference	Description
1	HAP Potential to Emit Emission Factors for Biomass Boilers Located in Pacific Northwest Indian Country, EPA Region 10, May 8, 2014. See http://www3.epa.gov/region10/pdf/air/technical/bbhappteef_memo.pdf
2	National Council for Air and Stream Improvement (NCASI) Technical Bulletin No. 973 entitled, "Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update." February 2010. EF reflects maximum of four values. See page 164 of NCASI TB 973. A 90th percentile value could not be calculated without knowledge of all four individual values. EF Reference No. 1 and the underlying Section 1.6 of AP-42 (September 2003) do not provide EF for methanol.

Non-HAP Potential to Emit

Emission Unit:	**BLR2**	
Description:	Donlee boiler	
Control Device:	None	
Fuel:	No. 2 Distillate Oil	
Design Maximum Heat Input Capcity:	37.8	MMBtu/hr
Maximum Fuel Consumption:	265	gal/hr
Operation:	8760	hr/yr

NON-FUGITIVE EMISSIONS

Potential to Emit, (tons per year)

Criteria Pollutant Emissions	EF (lb/K gal)	EF (lb/MMBtu)	ORL EF (lb/K gal)	PTE (tpy)	ORL PTE (tpy)	EF Reference
Carbon Monoxide (CO)	5			5.8		AP-42 (May 2010), Table 1.3-1
Lead (Pb)		9.E-06		1.49E-03		AP-42 (May 2010), Table 1.3-10
Nitrogen Oxides (NO_X)	20			23.2		AP-42 (May 2010), Table 1.3-1
Particulate (PM)		0.1974	2	32.7	2.3	40 CFR § 49.125(d)(1). 0.1 gr/dscf @ 7% O_2 PM emission limit. (0.1 gr/dscf @ 7% O_2) X (20.9)/(20.9-7) X (9190 dscf/MMBtu) X (lb/7000 gr) = 0.1974 lb/MMBtu. See Equation 1 of EPA Reference Method 19 (40 CFR Part 60) for basis of calculation to derive emission factor from FARR emission limit. PM emissions are the "filterable" fraction quantified via EPA Reference Method 5. PM emissions do not include the "condensible" fraction. See EPA final rulemaking in the October 25, 2012 Federal Register, pages 65107-65119, at http://www.gpo.gov/fdsys/pkg/FR-2012-10-25/pdf/2012-25978.pdf. ORL EF (uncontrolled) based upon AP-42 (May 2010), Table 1.3-1.
Inhalable Coarse Particulate (PM_{10})		0.1974	3.3	32.7	3.8	40 CFR § 49.125(d)(1). 0.1 gr/dscf @ 7% O2 PM emission limit. ORL EF (uncontrolled) based upon AP-42 (May 2010), Tables 1.3-1 (filterable PM) and 1.3-2 (condensible PM). Resultant emission factor is the sum of the two contributions.
Fine Particulate ($PM_{2.5}$)		0.1974	3.3	32.7	3.8	40 CFR § 49.125(d)(1). 0.1 gr/dscf @ 7% O2 PM emission limit. ORL EF (uncontrolled) based upon AP-42 (May 2010), Tables 1.3-1 (filterable PM) and 1.3-2 (condensible PM). Resultant emission factor is the sum of the two contributions.
Sulfur Dioxide (SO_2)	71.0	1.1469	7.1	82.4	8.2	AP-42 (May 2010), Table 1.3-1 assuming 0.5 percent by weight maximum sulfur in No. 2 distillate oil pursuant to 40 CFR §§ 49.130(d)(4) and 60.42c(d). From AP-42's Table 1.3-1: (142) X (0.5) = 71.0 lb/K gal. EPA Region 10 rejected use of the FARR's combustion source stack SO_2 limit of 500 ppvd @ 7% O_2 because no air pollution control device is employed to reduce SO_2 emissions and use of the limit results in an emission rate (1.1469 lb/MMBtu) producing a PTE over two times greater than the PTE resulting from use of FARR fuel sulfur limit. Derivation of 1.1469 lb/MMBtu emission factor follows: 40 CFR § 49.129(d)(1). 500 ppmvd @ 7% O_2 SO_2 emission limit. (500 ppmvd @ 7% O_2) X (20.9)/(20.9-7) X (1.66×10^{-7} lb/dscf / ppm) X (9190 dscf/MMBtu) = 1.1469 lb/MMBtu. See Equation 1 of EPA Reference Method 19 (40 CFR Part 60) for basis of calculation to derive emission factor from FARR emission limit. ORL EF (uncontrolled) based upon AP-42 (May 2010), Table 1.3-1 assuming 0.05 percent by weight maximum sulfur in No. 2 distillate oil.
Volatile Organic Compounds (VOC)	0.2			0.2		AP-42 (May 2010), Table 1.3-3

Greenhouse Gas Emissions (CO_2 Equivalent)		EF (lb/MMBtu)		PTE (tpy)		EF Reference
Carbon Dioxide (CO_2)		163.1		27,003		Tables A-1 and C-1 to 40 CFR Part 98. The GHG Reporting Rule (40 CFR 98) is considered the primary reference for estimating GHG emissions when preparing or processing permit applications. (73.96 kg CO_2/MMBtu) X (2.20462262 lb/kg) X (1 lb CO_2e/lb CO_2) = 163.1 lb/MMBtu.
Methane (CH_4)		0.165		27.3		Tables A-1 and C-2 to 40 CFR Part 98. The GHG Reporting Rule (40 CFR 98) is considered the primary reference for estimating GHG emissions when preparing or processing permit applications. (3.0×10^{-3} kg CH_4/MMBtu) X (2.20462262 lb/kg) X (25 lb CO_2e/lb CH_4) = 0.165 lb/MMBtu.
Nitrous Oxide (N_2O)		0.394		65.2		Tables A-1 and C-2 to 40 CFR Part 98. The GHG Reporting Rule (40 CFR 98) is considered the primary reference for estimating GHG emissions when preparing or processing permit applications. (6.0×10^{-4} kg N_2O/MMBtu) X (2.20462262 lb/kg) X (298 lb CO_2e/lb N_2O) = 0.394 lb/MMBtu.
TOTAL				27,096		

Appendix A: Potential Emissions Inventory

HAP Potential to Emit

Emission Unit:	**BLR2**		
Description:	Donlee boiler		
Control Device:	None		
Fuel:	No. 2 Distillate Oil		
Design Maximum Heat Input Capcity:	37.8	MMBtu/hr	
Maximum Fuel Consumption:	265	gal/hr	
Operation:	8760	hr/yr	

Potential to Emit, (tons per year)

Hazardous Air Pollutants	EF (lb/K gal)	PTE (tpy)	EF Reference
Trace Metal Compounds			
Arsenic Compounds (including arsine)	4.E-06	4.64E-06	AP-42 (May 2010), Table 1.3-9
Beryllium Compounds	3.E-06	3.48E-06	
Cadmium Compounds	3.E-06	3.48E-06	
Chromium Compounds (including hexavalent)	3.E-06	3.48E-06	
Lead Compounds (not elemental lead)	9.E-06	1.04E-05	
Manganese Compounds	6.E-06	6.96E-06	
Mercury Compounds	3.E-06	3.48E-06	
Nickel Compounds	3.E-06	3.48E-06	
Selenium Compounds	1.5E-05	1.74E-05	
Other Inorganic Compounds			
Organic Compounds			
Benzene	2.14E-04	2.48E-04	AP-42 (May 2010), Table 1.3-9
Ethyl benzene	6.36E-05	7.38E-05	
Formaldehyde	3.30E-02	3.83E-02	
Methyl chloroform (1,1,1-trichloroethane)	2.36E-04	2.74E-04	
Naphthalene[1]	1.13E-03	1.31E-03	
Polycyclic Organic Matter (POM)[2]	1.19E-03	1.38E-03	
Toluene	6.20E-03	7.20E-03	
Xylenes (inlc isomers and mixtures)	1.09E-04	1.27E-04	
TOTAL[3]	0.04106	0.05	

[1] designates a HAP that is subject individually to the 10 tpy major source threshold, but that is also one of several polycyclic organic matter (POM) compounds that, in aggregate, are subject to the same 10 tpy major source threshold.

[2] See table below for list of individual POM compounds. POM defines a broad class of compounds that generally includes all organic structures having two or more fused aromatic rings (i.e., rings that share a common border), and that have a boiling point greater than or equal to 212°F (100°C). See http://www3.epa.gov/ttn/atw/hlthef/polycycl.html#ref11

[3] Because naphthalene is accounted for individually and in the calculation of POM EF, its individual contribution here is discounted so as to avoid double-counting.

Polycyclic Organic Matter (POM)	EF (lb/K gal)	EF Reference
Acenaphthene	2.11E-05	AP-42 (May 2010), Table 1.3-9
Acenaphthylene	2.53E-07	
Anthracene	1.22E-06	
Benz(a)anthracene	4.01E-06	
Benzo(b,k)fluoranthene	1.48E-06	
Benzo(g,h,i)perylene	2.26E-06	
Chrysene	2.38E-06	
Dibenzo(a,h)anthracene	1.67E-06	
Fluoranthene	4.84E-06	
Fluorene	4.47E-06	
Indo(1,2,3-cd)pyrene	2.14E-06	
Naphthalene*	1.13E-03	
Octachlorodibenzo-p-dioxin	3.10E-09	
Phenanthrene	1.05E-05	
Pyrene	4.25E-06	
SUBTOTAL	1.19E-03	

* designates a POM compound that is also an individual HAP.

Non-HAP Potential to Emit

Emission Unit:	**BLR3**	
Description:	Cleaver Brooks boiler	
Control Device:	None	
Fuel:	No. 2 Distillate Oil	
Design Maximum Heat Input Capcity:	8.4	MMBtu/hr
Maximum Fuel Consumption:	60	gal/hr
Operation:	8760	hr/yr

NON-FUGITIVE EMISSIONS

Potential to Emit, (tons per year)

Criteria Pollutant Emissions	EF (lb/K gal)	EF (lb/MMBtu)	ORL EF (lb/K gal)	PTE (tpy)	ORL PTE (tpy)	EF Reference
Carbon Monoxide (CO)	5			1.3		AP-42 (May 2010), Table 1.3-1
Lead (Pb)		9.E-06		3.31E-04		AP-42 (May 2010), Table 1.3-10
Nitrogen Oxides (NO_X)	20			5.3		AP-42 (May 2010), Table 1.3-1
Particulate (PM)		0.1974	2	7.3	0.5	40 CFR § 49.125(d)(1). 0.1 gr/dscf @ 7% O_2 PM emission limit. (0.1 gr/dscf @ 7% O_2) X (20.9)/(20.9-7) X (9190 dscf/MMBtu) X (lb/7000 gr) = 0.1974 lb/MMBtu. See Equation 1 of EPA Reference Method 19 (40 CFR Part 60) for basis of calculation to derive emission factor from FARR emission limit. PM emissions are the "filterable" fraction quantified via EPA Reference Method 5. PM emissions do not include the "condensible" fraction. See EPA final rulemaking in the October 25, 2012 Federal Register, pages 65107-65119, at http://www.gpo.gov/fdsys/pkg/FR-2012-10-25/pdf/2012-25978.pdf. ORL EF (uncontrolled) based upon AP-42 (May 2010), Table 1.3-1.
Inhalable Coarse Particulate (PM_{10})		0.1974	3.3	7.3	0.9	40 CFR § 49.125(d)(1). 0.1 gr/dscf @ 7% O2 PM emission limit. ORL EF (uncontrolled) based upon AP-42 (May 2010), Tables 1.3-1 (filterable PM) and 1.3-2 (condensible PM). Resultant emission factor is the sum of the two contributions.
Fine Particulate ($PM_{2.5}$)		0.1974	3.3	7.3	0.9	40 CFR § 49.125(d)(1). 0.1 gr/dscf @ 7% O2 PM emission limit. ORL EF (uncontrolled) based upon AP-42 (May 2010), Tables 1.3-1 (filterable PM) and 1.3-2 (condensible PM). Resultant emission factor is the sum of the two contributions.
Sulfur Dioxide (SO_2)	7.1	~~1.1469~~		1.9		AP-42 (May 2010), Table 1.3-1 assuming 0.5 percent by weight maximum sulfur in No. 2 distillate oil pursuant to 40 CFR §§ 49.130(d)(4). From AP-42's Table 1.3-1: (142) X (0.5) = 71.0 lb/K gal. EPA Region 10 rejected use of the FARR's combustion source stack SO_2 limit of 500 ppvd @ 7% O_2 because no air pollution control device is employed to reduce SO_2 emissions and use of the limit results in an emission rate (1.1469 lb/MMBtu) producing a PTE over two times greater than the PTE resulting from use of FARR fuel sulfur limit. Derivation of 1.1469 lb/MMBtu emission factor follows: 40 CFR § 49.129(d)(1). 500 ppmvd @ 7% O_2 SO_2 emission limit. (500 ppmvd @ 7% O_2) X (20.9)/(20.9-7) X (1.66×10^{-7} lb/dscf / ppm) X (9190 dscf/MMBtu) = 1.1469 lb/MMBtu. See Equation 1 of EPA Reference Method 19 (40 CFR Part 60) for basis of calculation to derive emission factor from FARR emission limit.
Volatile Organic Compounds (VOC)	0.2			0.1		AP-42 (May 2010), Table 1.3-3

Greenhouse Gas Emissions (CO_2 Equivalent)		EF (lb/MMBtu)		PTE (tpy)		EF Reference
Carbon Dioxide (CO_2)		163.1		6,001		Tables A-1 and C-1 to 40 CFR Part 98. The GHG Reporting Rule (40 CFR 98) is considered the primary reference for estimating GHG emissions when preparing or processing permit applications. (73.96 kg CO_2/MMBtu) X (2.20462262 lb/kg) X (1 lb CO_2e/lb CO_2) = 163.1 lb/MMBtu.
Methane (CH_4)		0.165		6.1		Tables A-1 and C-2 to 40 CFR Part 98. The GHG Reporting Rule (40 CFR 98) is considered the primary reference for estimating GHG emissions when preparing or processing permit applications. (3.0×10^{-3} kg CH_4/MMBtu) X (2.20462262 lb/kg) X (25 lb CO_2e/lb CH_4) = 0.165 lb/MMBtu.
Nitrous Oxide (N_2O)		0.394		14.5		Tables A-1 and C-2 to 40 CFR Part 98. The GHG Reporting Rule (40 CFR 98) is considered the primary reference for estimating GHG emissions when preparing or processing permit applications. (6.0×10^{-4} kg N_2O/MMBtu) X (2.20462262 lb/kg) X (298 lb CO_2e/lb N_2O) = 0.394 lb/MMBtu.
TOTAL				6,021		

Appendix A: Potential Emissions Inventory

HAP Potential to Emit

Emission Unit:	**BLR3**	
Description:	Cleaver Brooks boiler	
Control Device:	None	
Fuel:	No. 2 Distillate Oil	
Design Maximum Heat Input Capcity:	8.4	MMBtu/hr
Maximum Fuel Consumption:	60	gal/hr
Operation:	8760	hr/yr

Potential to Emit, (tons per year)

Hazardous Air Pollutants	EF (lb/K gal)	PTE (tpy)	EF Reference
Trace Metal Compounds			
Arsenic Compounds (including arsine)	4.E-06	1.05E-06	AP-42 (May 2010), Table 1.3-9
Beryllium Compounds	3.E-06	7.88E-07	
Cadmium Compounds	3.E-06	7.88E-07	
Chromium Compounds (including hexavalent)	3.E-06	7.88E-07	
Lead Compounds (not elemental lead)	9.E-06	2.37E-06	
Manganese Compounds	6.E-06	1.58E-06	
Mercury Compounds	3.E-06	7.88E-07	
Nickel Compounds	3.E-06	7.88E-07	
Selenium Compounds	1.5E-05	3.94E-06	
Other Inorganic Compounds			
Organic Compounds			
Benzene	2.14E-04	5.62E-05	AP-42 (May 2010), Table 1.3-9
Ethyl benzene	6.36E-05	1.67E-05	
Formaldehyde	3.30E-02	8.67E-03	
Methyl chloroform (1,1,1-trichloroethane)	2.36E-04	6.20E-05	
Naphthalene[1]	1.13E-03	2.97E-04	
Polycyclic Organic Matter (POM)[2]	1.19E-03	3.13E-04	
Toluene	6.20E-03	1.63E-03	
Xylenes (inlc isomers and mixtures)	1.09E-04	2.86E-05	
TOTAL[3]	0.041062	0.011	

[1] designates a HAP that is subject individually to the 10 tpy major source threshold, but that is also one of several polycyclic organic matter (POM) compounds that, in aggregate, are subject to the same 10 tpy major source threshold.

[2] See table below for list of individual POM compounds. POM defines a broad class of compounds that generally includes all organic structures having two or more fused aromatic rings (i.e., rings that share a common border), and that have a boiling point greater than or equal to 212°F (100°C). See http://www3.epa.gov/ttn/atw/hlthef/polycycl.html#ref11

[3] Because naphthalene is accounted for individually and in the calculation of POM EF, its individual contribution here is discounted so as to avoid double-counting.

Polycyclic Organic Matter (POM)	EF (lb/K gal)	EF Reference
Acenaphthene	2.11E-05	AP-42 (May 2010), Table 1.3-9
Acenaphthylene	2.53E-07	
Anthracene	1.22E-06	
Benz(a)anthracene	4.01E-06	
Benzo(b,k)fluoranthene	1.48E-06	
Benzo(g,h,i)perylene	2.26E-06	
Chrysene	2.38E-06	
Dibenzo(a,h)anthracene	1.67E-06	
Fluoranthene	4.84E-06	
Fluorene	4.47E-06	
Indo(1,2,3-cd)pyrene	2.14E-06	
Naphthalene*	1.13E-03	
Octachlorodibenzo-p-dioxin	3.10E-09	
Phenanthrene	1.05E-05	
Pyrene	4.25E-06	
SUBTOTAL	1.19E-03	

* designates a POM compound that is also an individual HAP.

Non-HAP and HAP Potential to Emit

Emission Unit: **D1 & D2**
Description: Thermo-mechanical refining of fiber and drying in a steam-heated tube dryer (non-blowline blend). Recovery of fiber via cyclone. Two lines.
Refiners: Andritz Model No. 42ICP. Dryers: Westec. Dryer Cyclones: 11" diameter Guaranteed Performance.
Cyclones recover dried fiber.
Installation: Refiners installed November 1, 1994. Dryers and dryer cyclones installed November 1, 1995.
Control Device: None for Stage 1 operation. Cyclones are process equipment and not air pollution control devices. Baghouses for Stages 2 and 3.
Wood Species: Pacific northwest softwood species
ORL on Fiber Throughput: 51100 odt/yr January 29, 2016 fiber throughput ORL to establish synthetic minor HAP source
Maximum Volumetric Flow Rate: 79230 ft^3/min. considering both exhausts
2.92 odt/hr each

NON-FUGITIVE EMISSIONS
Potential to Emit, (tons per year)

Criteria Pollutant Emissions	EF (lb/odt)	ORL EF (lb/odt)	PTE (tpy)	ORL PTE (tpy)	EF Reference
Carbon Monoxide (CO)	0.11		2.8		AP-42 (August 2002), Table 10.6.3-2
Particulate (PM)	3.64	0.04	92.9	1.0	Entropy, Inc. Stationary Source Sampling Report Reference No. 17711, Jeld-Wen, Marion, NC. Fiber Line No. 1 Dryer Cyclone No. 1. August 2002. Former White Swan facility operator Jeld-Wen reproduced the report and emission factor derivation in its February 20, 2003 submittal to EPA Region 10. See also Jeld-Wen White Swan facility May 2003 Title V application. EF = (12.36 lb/hr / 12.814 msf/hr) X (msf / 530.7 od lb fiber) X (2000 lb/ton) = 3.64 lb/odt. PTE based upon compliance with FARR's process source stack PM limit of 0.1 gr/dscf at 40 CFR § 49.125(d)(3) is equal to 297 tpy and is calculated as follows: 297 tpy = (79230 ft^3/min) X (0.1 gr/ft^3) X (lb/7000 gr) X (ton/2000 lb) X (60 min/hr) X (8760 hr/yr). Because source testing indicates uncontrolled emissions less than 297 tpy, the FARR's process source stack PM limit will not be employed to determine PTE. For ORL EF: Oregon Department of Environmental Quality's AQ-EF02 entitled, "Emission Factors - Wood Products " August 1, 2011. For baghouse control on a cyclone - sanderdust, EF = 0.04 lb/odt.
Inhalable Coarse Particulate (PM_{10})	3.37	0.0398	86.1	1.0	As indicated above in PM discussion, the FARR's process source stack PM limit will not be employed to determine PTE becuase source testing indicates uncontrolled emissions less than FARR limit. For filterable PM: Oregon Department of Environmental Quality's AQ-EF03 entitled, "Emission Factors for Wood Products - $PM_{10}/PM_{2.5}$ Fraction." August 1, 2011. For medium efficiency cyclone, PM_{10} fraction of PM is 85%, and $PM_{2.5}$ fraction of PM is 50%. For condensible PM, see Entropy's test report referenced above. EF = filterable PM + condensible PM. For PM_{10}, EF = (3.64 lb/odt)(0.85) + (0.956 lb/hr / 12.814 msf/hr) X (msf / 530.7 od lb fiber) X (2000 lb/ton) = 3.37 lb/odt. For $PM_{2.5}$, EF = (3.64 lb/odt)(0.5) + (0.956 lb/hr / 12.814 msf/hr) X (msf / 530.7 od lb fiber) X (2000 lb/ton) = 2.10 lb/odt. For PM_{10} ORL, EF = (0.04 lb/odt)(0.995) = 0.0398 lb/odt where 0.995 is PM_{10} fraction of PM exiting bag filter system installed on the exhaust of a cyclone pursuant to Oregon DEQ's AQ-EF03. For $PM_{2.5}$ ORL, EF = (0.04 lb/odt)(0.99) = 0.0396 lb/odt where 0.99 is $PM_{2.5}$ fraction of PM exiting bag filter system installed on the exhaust of a cyclone pursuant to Oregon DEQ's AQ-EF03.
Fine Particulate ($PM_{2.5}$)	2.10	0.0396	53.6	1.0	
Volatile Organic Compounds (VOC)	2.08		53.20		For the purpose of this PTE inventory, it is assumed that the facility complies with PCWP MACT Table 1A production-based compliance options for pressurized refiners and primary tube dryers based upon Neucor's intentions as declared to EPA in January 29, 2016 minor NSR application. VOC PTE EF = uncontrolled EF. For uncontrolled EF, see National Council for Air and Stream Improvement (NCASI) Technical Bulletin No. 770 entitled, "Volatile Organic Compound Emissions from Wood Products Manufacturing Facility, Part III - Medium Density Fiberboard." January 1999. NCASI TB 770 emission source 100-2DT2 is a non-blowline blend core dryer processing pacific northwest softwood, and sampling was conducted upstream of organic vapor control device. The adjustment for MACT compliance lowers the allowed contribution by those VOCs that are also HAPs limited by the MACT standard.

Hazardous Air Pollutants	EF (lb/odt)		PTE (tpy)		EF Reference
Acetaldehyde	0		0.0		Although the facility is subject to PCWP MACT, it has not yet demonstrated compliance with either production-based compliance options (Table 1A to PCWP MACT) or add-on control system compliance options (Table 1B to PCWP MACT). Compliance is required upon start-up. For the purpose of this PTE inventory, it is assumed that the facility complies with PCWP MACT Table 1A production-based compliance options for pressurized refiners (0.039 lb HAP/odt) and primary tube dryers (0.26 lb HAP/odt) based upon Neucor's intentions as declared to EPA in January 29, 2016 minor NSR application. It is also assumed that a production line's separate emission limits for refiners and dryers are combined (0.299 lb HAP/odt) given that the refiner exhausts through the dryer. It is also assumed that all HAP emitted is formaldehyde and methanol in the proportion measured during February 6, 2008 testing of non-blowline blend White Swan emisssion unit D2 while processing pacific northwest softwood. Acetaldehyde, acrolein, phenol and propionaldehyde were not detected in the four runs conducted.
Acrolein	0		0.0		
Formaldehyde	0.020		0.5		
Methanol	0.279		7.1		
Phenol	0		0.0		
Propionaldehyde	0		0.0		
TOTAL	0.299		7.6		

Appendix A: Potential Emissions Inventory

Emission Generating Activity: Core Tube Dryer.
NCASI Technical Bulletin No. 770 entitled, "Volatile Organic Compound Emissions from Wood Products Manufacturing Facilities." January 1999. Page B3.
EF derivation for WPP1 VOC

Pollutant	Run No.	100-2DT2 lb/odt	100-2DT2 lb/odt (as propane RM25A)	Adjustment for MACT Compliance
Acetone	1	0.06	0.030	
	2	**0.0525**	0.027	
Formaldehyde	1	0.096	0	0.020
	2	0.054	0	0.020
	EF (greater of two values):	0.096		
Methanol	1	0.63	0.145	0.279
	2	0.95	0.218	0.279
	EF (greater of two values):	0.95		
VOC (as carbon)	1	1.6	1.958	
	2	1.4	1.713	
	EF (greater of two values):	1.6		
WPP1 VOC	1	2.51		2.08
	2	2.47		1.77
	EF (greater of two values):	2.51		2.08

The adjustment for MACT compliance lowers the allowed contribution by those VOCs that are also HAPs limited by the MACT standard.

EF in bold are substitute values given non-detect test measurement

Reference Information
Element and Compound Information

Element / Compound	FID RF	MW (lb/lb-mol)	Formula	Carbon Atoms	Hydrogen Atoms	Oxygen Atoms
Acetone (non-VOC)	0.6667	58.0798	C_3H_6O	3	6	1
Formaldehyde	0	30.0262	CH_2O	1	2	1
Methanol	0.5	32.0420	CH_4O	1	4	1
Propane	1	44.0962	C_3H_8	3	8	0
Carbon	-	12.0110	C	1	-	-
Hydrogen	-	1.0079	H	-	1	-
Oxygen	-	15.9994	O	-	-	1

FID RF = ECN / No. carbon atoms in compound. See Attachment No. 2 to NCASI's September 2011 Technical Bulletin No. 991 (TB768) - Volatile Organic Compound Emissions from Wood Products Manufacturing Facilities Part I - Plywood.
In the absence of information related to the FID NCASI employed to conduct RM25A testing, empirical effective carbon number (ECN) values will be employed to estimate FID RF.

ECN = (no. aliphatic carbon) + (no. aromatic carbon) - (no. ether oxygen) - (0.5 x no. primary alcohol oxygen)
Calculations to estimate ECN for several compounds:

Element / Compound	Formula	No. Aliphatic Carbon	No. Aromatic Carbon	No. Carbonyl Carbon	No. Carboxyl Carbon	No. Ether Oxygen	No. Primary Alcohol Oxygen	Empirical ECN
Acetone (non-VOC)	$(CH_3)_2CO$	2		1				2
Formaldehyde	CH_2O							0
Methanol	CH_3OH	1					1	0.5
Propane	C_3H_8	3						3

Emission Generating Activity: Core Tube Dryer.
February 6, 2008 testing of non-blowline blend White Swan emisssion unit D2
EF derivation for formaldehyde and methanol assuming total HAP emissions equal PCWP MACT production-based emission limit of 0.299 lb/odt.

Pollutant	Test Measurement (lb/odt)	PCWP MACT (lb/odt)	
Formaldehyde	0.059	**0.020**	not a resin driven result.
Methanol	0.84	**0.279**	
		0.299	

Non-HAP and HAP Potential to Emit

Emission Unit: **F1 & F2**
Description: Blenders and fiber formers
No cyclones. Baghouses F1 and F2 recover resinated fiber directly from fiber former exhaust; and not from pneumatic stream of reject material.
Control Device: Baghouses. In the absence of a demonstration otherwise, baghouses are generally considered air pollution control devices rather than process equipment.
Wood Species: Pacific northwest softwood species
Resin: MDI

ORL on Fiber Throughput:	51100	odt/yr	January 29, 2016 fiber throughput ORL to establish synthetic minor HAP source
Max % Fiber Exhausted to Baghouse:	0.5	%	
Maximum Volumetric Flow Rate:	40000	ft^3/min. considering both exhausts	
	2.917	odt/hr each	

NON-FUGITIVE EMISSIONS
Potential to Emit, (tons per year)

Criteria Pollutant Emissions	EF (lb/odt)	ORL "A" EF (lb/odt)	ORL "B" EF (lb/odt)	PTE (tpy)	ORL "A" PTE (tpy)	ORL "B" PTE (tpy)	EF Reference
Particulate (PM)	10.0	0.0002	0.003	255.5	5.11E-03	7.7E-02	EF = (0.005 ton PM/odt) X (2000 lb PM/ton PM) = 10 lb PM/odt based upon assumption provided by applicant. Applying 0.04 lb PM/ton PM EF for baghouse control of cyclone-sanderdust exhaust from Oregon DEQ's AQ-EF02 (August 1, 2011) entitled, "Emission Factors - Wood Products," ORL "A" EF = (10 lb PM/odt) X (ton PM/2000 lb PM) X (0.04 lb PM/ton PM) = 2.0x10^{-4} lb/odt. Applying control efficiency of 99.97% as specified by manufacturer Carter Day for a Model 156 RF10 baghouse, ORL "B" EF = (10 lb/odt) X (1-0.9997) = 3.0x10^{-3} lb/odt. I recommend employing ORL "B" EF because it is based upon manufacturer's specifications of equipment actually being employed. PTE based upon compliance with FARR's process source stack PM limit of 0.1 gr/dscf at 40 CFR § 49.125(d)(3) is equal to 150 tpy and is calculated as follows: 150 tpy = (40000 ft^3/min) X (0.1 gr/ft^3) X (lb/7000 gr) X (ton/2000 lb) X (60 min/hr) X (8760 hr/yr). The FARR's process source stack PM limit will not be employed to determine PTE given need for ORL to make unnecessary $PM_{2.5}$ ambient impact analysis. This calculation does seem to suggest that F1 & F2 emissions will exceed FARR process source stack PM limit unless controlled.
Inhalable Coarse Particulate (PM_{10})	10.0	1.99E-04	3.0E-03	255.5	5.08E-03	7.7E-02	As indicated above in PM discussion, the FARR's process source stack PM limit will not be employed to determine PTE given the need for ORL to make unnecessary $PM_{2.5}$ ambient impact analysis. See derivation above for PM_{10} and $PM_{2.5}$ EF assuming all PM has aerodynamic diameter less than 2.5 microns. For PM_{10} and $PM_{2.5}$ ORL "A" EF's, multiply PM ORL "A" EF by factors of 0.995 and 0.99, respectively, to reflect PM_{10}/$PM_{2.5}$ fraction of PM exiting bag filter system in accordance with Oregon DEQ's AQ-EF03 entitled, "Emission Factors for Wood Products - PM_{10}/$PM_{2.5}$ Fraction." August 1, 2011. Because application specified only a single control efficiency for the Carter Day baghouse, PM_{10} and $PM_{2.5}$ ORL "B" EF's equal to PM EF.
Fine Particulate ($PM_{2.5}$)	10.0	1.98E-04	3.0E-03	255.5	5.06E-03	7.7E-02	
Volatile Organic Compounds (VOC)	0.552		0.103	14.1		2.6	No emission factor available for non-blowline blend core former processing pacific northwest softwood with MDI resin. For urea formaldehdye (UF) resin, see National Council for Air and Stream Improvement (NCASI) Technical Bulletin No. 770 entitled, "Volatile Organic Compound Emissions from Wood Products Manufacturing Facility, Part III - Medium Density Fiberboard." January 1999. NCASI TB 770 emission source 100-1FO1 is a non-blowline blend core former processing pacific northwest softwood with UF resin. See page B7 of NCASI TB 770. Employing UF EF may overestimate emissions generated by a blender and fiber former processing MDI-resinated fiber. Applicant asumed blender/former emssion factors are half the dryer emission factors - testing will verify this

Hazardous Air Pollutants	EF (lb/odt)			PTE (tpy)			EF Reference
Acetaldehyde				0.0		0.0	No emission factor available for non-blowline blend core former processing pacific northwest softwood with MDI resin. For urea formaldehdye (UF) resin, see National Council for Air and Stream Improvement (NCASI) Technical Bulletin No. 770 entitled, "Volatile Organic Compound Emissions from Wood Products Manufacturing Facility, Part III - Medium Density Fiberboard." January 1999. NCASI TB 770 emission source 100-1FO1 is a non-blowline blend core former processing pacific northwest softwood with UF resin. See page B7 of NCASI TB 770. Employing UF EF may overestimate emissions generated by a blender and fiber former processing MDI-resinated fiber. Applicant asumed blender/former emssion factors are half the dryer emission factors - testing will verify this.
Acrolein				0.0		0.0	
Formaldehyde	0.104		0.0420	2.6		1.1	
Methanol	0.448		0.0614	11.4		1.6	
Methylene diphenyl diisocyanate				0.0		0.0	
Phenol				0.0		0.0	
Propionaldehdye				0.0		0.0	
TOTAL	0.552		0.1034	14.1		2.6	

Emission Generating Activity: Non-Blowline Blend UF Core Former Exhaust (includes blender emissions)
NCASI Technical Bulletin No. 770 entitled, "Volatile Organic Compound Emissions from Wood Products Manufacturing Facilities." January 1999.

Pollutant	Run No.	100-1FO1 (lb/odt)
Formaldehyde	1	0.12
	2	0.022
	3	0.038
	90th percentile value:	0.104
Methanol	1	0.40
	2	0.38
	3	0.46
	90th percentile value:	0.448

Non-HAP and HAP Potential to Emit

Emission Unit: **P1 & P2**
Description: Multi-platen hot pressing of methylene diphenyl diisocyanate (MDI) resinated fiber mats.
Core panels will be pressed to a density of approximately 45 to 50 lb/ft^3 and an average board thickness of 0.130".
No cyclones. No baghouses.
Control Device: None.
Wood Species: Pacific northwest softwood species
Resin: MDI
ORL on Panel Production: 38915 msf/yr (3/4" basis) January 29, 2016 panel production ORL to establish synthetic minor HAP sou
Maximum Volumetric Flow Rate: 56000 ft^3/min. considering both exhausts
2.221 msf/hr each

NON-FUGITIVE EMISSIONS
Potential to Emit, (tons per year)

Criteria Pollutant Emissions	EF (lb/msf 3/4" basis)	PTE (tpy)	EF Reference
Carbon Monoxide (CO)	0.034	0.7	AP-42 (August 2002), Table 10.6.3-5
Nitrogen Oxides (NO_X)	0.030	0.6	AP-42 (August 2002), Table 10.6.3-5
Particulate (PM)	0.18	3.5	AP-42 (August 2002), Table 10.6.3-4. PTE based upon compliance with FARR's process source stack PM limit of 0.1 gr/dscf at 40 CFR § 49.125(d)(3) is equal to 210 tpy and is calculated as follows: 210 tpy = (56000 ft^3/min) X (0.1 gr/ft^3) X (lb/7000 gr) X (ton/2000 lb) X (60 min/hr) X (8760 hr/yr). The FARR's process source stack PM limit will not be employed to determine PTE because uncontrolled emissions appear to be far less based upon AP-42 EF.
Inhalable Coarse Particulate (PM_{10})	0.35	6.8	AP-42 (August 2002), Table 10.6.3-4. PM_{10} and $PM_{2.5}$ = filterable (0.15) + condensible (0.2). Assume $PM_{2.5}$ filterable equal to PM_{10} filterable. As indicated above in PM discussion, the FARR's process source stack PM limit will not be employed to determine PTE given that uncontrolled emissions appear to be far less based upon AP-42 EF.
Fine Particulate ($PM_{2.5}$)	0.35	6.8	
Volatile Organic Compounds (VOC)	3.0E-01	5.8	No RM25A VOC emission factor available for non-blowline blend press processing pacific northwest softwood with MDI resin. For urea formaldehdye (UF) resin, see National Council for Air and Stream Improvement (NCASI) Technical Bulletin No. 770 entitled, "Volatile Organic Compound Emissions from Wood Products Manufacturing Facility, Part III - Medium Density Fiberboard." January 1999. NCASI TB 770 emission source 100-1PB1 to 1PB4 are four vents from a single press tested while processing pacific northwest softwood and employing upstream non-blowline blend UF resin. Because employing UF EF may overestimate emissions generated by a press processing MDI-resinated fiber, the UF EF will not be employed. Instead, VOC PTE EF based upon PCWP MACT limits (for six specific HAPs) plus measured MDI emission rate. This likely underestimates PTE as only a portion of VOC is organic HAP. See

Hazardous Air Pollutants	EF (lb/msf 3/4" basis)	PTE (tpy)	EF Reference
Acetaldehyde	0	0	HAP except methylene diphenyl diisocyanate (MDI): Although the facility is subject to PCWP MACT, it has not yet demonstrated compliance with either production-based compliance options (Table 1A to PCWP MACT) or add-on control system compliance options (Table 1B to PCWP MACT). Compliance is required upon start-up. For the purpose of this PTE inventory, it is assumed that the facility complies with PCWP MACT Table 1A production-based compliance options for reconstituted wood product presses (0.30 lb HAP/odt) based upon Neucor's intentions as declared to EPA in January 29, 2016 minor NSR application. It is also assumed that all HAP emitted is formaldehyde given results of February 6 and 7, 2008 testing of non-blowline blend White Swan emisssion unit P2 while processing pacific northwest softwood. Acetaldehyde, acrolein, methanol, phenol and propionaldehyde were not detected in the five runs conducted. For MDI, this HAP is not one of the six limited by the PCWP MACT. Therefore, MDI PTE is based upon February 2008 emission testing results. Site-specific test-derived emission rate of 2.6×10^{-6} lb/msf 1/8" basis converted to 1.6×10^{-5} lb/msf 3/4" basis as follows: 1.6×10^{-5} lb/msf 3/4" = (2.6×10^{-6} lb/msf 1/8") X (3/4) / (1/8)
Acrolein	0	0	
Formaldehyde	3.0E-01	5.8	
Methanol	0	0	
Methylene diphenyl diisocyanate	1.6E-05	3.0E-04	
Phenol	0	0	
Propionaldehyde	0	0	
TOTAL	3.00016E-01	5.8E+00	

Non-HAP and HAP Potential to Emit

Emission Unit:	C1 & C2		
Description:	Board coolers No cyclones. No baghouses.		
Control Device:	None		
Wood Species:	Pacific northwest softwood species		
Resin:	MDI		
ORL on Panel Production:	38,915	msf/yr (3/4" basis)	January 29, 2018 panel production ORL to establish synthetic minor HAP source
	2.221	msf/hr each	

NON-FUGITIVE EMISSIONS

Potential to Emit, (tons per year)

Criteria Pollutant Emissions	EF (lb/msf 3/4" basis)	PTE (tpy)	EF Reference
Particulate (PM)	0.054	1.1	AP-42 (August 2002), Table 10.6.3-4. Because applicant did not provide maximum volumetric flow rate of system, it is not possible to determine PTE based upon the FARR's process source stack PM limit of 0.1 gr/dscf at 40 CFR § 49.125(d)(3).
Inhalable Coarse Particulate (PM_{10})	0.0038	0.1	AP-42 (August 2002), Table 10.6.3-4. PM_{10} and $PM_{2.5}$ = filterable + condensible. Assume $PM_{2.5}$ filterable equal to PM_{10} filterable. No measurable condensible PM contribution. Because applicant did not provide maximum volumetric flow rate of system, it is not possible to determine PTE based upon the FARR's process source stack PM limit of 0.1 gr/dscf at 40 CFR § 49.125(d)(3).
Fine Particulate ($PM_{2.5}$)	0.0038	0.1	
Volatile Organic Compounds (VOC)	0.1517	3.0	No emission factor available for non-blowline blend board cooler processing pacific northwest softwood with MDI resin. For UF resin, see AP-42 (August 2002), Table 10.6.3-6. SCC 3-07-009-71. Employing UF EF may overestimate emissions generated by a board cooler processing MDI-resinated board.

Hazardous Air Pollutants	EF (lb/msf 3/4" basis)	PTE (tpy)	EF Reference
Acetaldehyde	0.001	0.02	No emission factor available for non-blowline blend board cooler processing pacific northwest softwood with MDI resin. For UF resin, see AP-42 (August 2002), Table 10.6.3-6. SCC 3-07-009-71. Employing UF EF may overestimate emissions generated by a board cooler processing MDI-resinated board.
Acrolein	0.00022	0.004	
Formaldehyde	0.042	0.82	
Methanol	0.025	0.49	
Methyl Ethyl Ketone	0.00011	0.002	
TOTAL	0.068	1.3	

Emission Generating Activity: Board Cooling.
AP-42 (August 2002), Table 10.6.3-6. SCC 3-07-009-71.
EF derivation for WPP1 VOC

Pollutant	EF (lb/msf 3/4" basis)	100-2DT2 lb/msf 3/4" (as propane RM25A)
Acetaldehyde	0.001	0.0003
Acetone	0.0092	0.0047
Acrolein	0.00022	0.0001
Formaldehyde	0.042	0
Methanol	0.025	0.0057
Methyl Ethyl Ketone	0.00011	0.0001
VOC (as carbon)	0.077	0.0942
WPP1 VOC	0.15	

Reference Information

Element and Compound Information

Element / Compound	FID RF	MW (lb/lb-mol)	Formula	Carbon Atoms	Hydrogen Atoms	Oxygen Atoms
Acetaldehyde	0.5	44.0530	C_2H_4O	2	4	1
Acetone (non-VOC)	0.6667	58.0798	C_3H_6O	3	6	1
Acrolein	0.6667	56.0640	C_3H_4O	3	4	1
Formaldehyde	0	30.0262	CH_2O	1	2	1
Methanol	0.5	32.0420	CH_4O	1	4	1
Methyl Ethyl Ketone	0.75	72.1066	C_4H_8O	4	8	1
Propane	1	44.0962	C_3H_8	3	8	0
Carbon	-	12.0110	C	1	-	-
Hydrogen	-	1.0079	H	-	1	-
Oxygen	-	15.9994	O	-	-	1

FID RF = ECN / No. carbon atoms in compound. See Attachment No. 2 to NCASI's September 2011 Technical Bulletin No. 991 (TB768) - Volatile Organic Compound Emissions from Wood Products Manufacturing Facilities Part I - Plywood. In the absence of information related to the FID NCASI employed to conduct RM25A testing, empirical effective carbon number (ECN) values will be employed to estimate FID RF.

ECN = (no. aliphatic carbon) + (no. aromatic carbon) - (no. ether oxygen) - (0.5 x no. primary alcohol oxygen)
Calculations to estimate ECN for several compounds:

Element / Compound	Formula	No. Aliphatic Carbon	No. Aromatic Carbon	No. Carbonyl Carbon	No. Carboxyl Carbon	No. Ether Oxygen	No. Primary Alcohol Oxygen	Empirical ECN
Acetaldehyde	CH_3CHO	1		1				1
Acetone (non-VOC)	$(CH_3)_2CO$	2		1				2
Acrolein	CH_2CHCHO	2		1				2
Formaldehyde	CH_2O							0
Methanol	CH_3OH	1					1	0.5
Methyl Ethyl Ketone	$CH_3C(O)CH_2CH_3$	3		1				3
Propane	C_3H_8	3						3

Non-HAP and HAP Potential to Emit

Emission Unit: **MHS, MR1 and MR2S**
Description: Pneumatic conveyance of wood residue including MHS, MR1 and MR2S (The third system listed for MR2S is that portion of MR2S that operates when line 1 operates)
ORL on Fiber Throughput: 51100 odt/yr January 29, 2016 fiber throughput ORL to establish synthetic minor HAP source
ORL on Panel Production: 38,915 msf/yr (3/4" basis)

ORL to install and operate baghouses makes unnecessary $PM_{2.5}$ ambient impact analysis.
ORL "A" EF based upon Oregon DEQ PM, PM_{10} and $PM_{2.5}$ emission factors for pneumatic conveyance of wood residue to target boxes, cyclones and baghouses. The EF are not site-specific.
ORL "B" EF are similarly based upon Oregon DEQ EF except that manufacturer-specific baghouse control efficiencies (provided by applicant) are substituted as appropriate.

NON-FUGITIVE EMISSIONS
Potential to Emit, (tons per year)

Emissions Generating Activity	Baghouse ID, Make & Model	Maximum Flow[1] (ft^3/min)	FARR 0.1 gr/dscf PM/PM_{10}/$PM_{2.5}$ PTE (tpy)	Portion of Total Throughput[1] (%)	Stream Throughput (ODT/yr)	PM EF (lb/ODT)	PM PTE (tpy)	PM ORL "A" EF (lb/ODT)	PM ORL "A" PTE (tpy)	PM ORL "B" EF (lb/ODT)	PM ORL "B" PTE (tpy)
Pneumatic conveyance of wood residue (suspended in head space of silo?) from RMS to BHS. (The wood residue does not travel through cyclone en route to BHS.)	BHS / Carter Day 375 RF10	35000	131.4	10.0	5,110	0.1	0.3	0.004	0.0	0.00003	0.000
Pneumatic conveyance of wood residue from Lines No. 1 and No. 2 sizing and screening to PFC1 and PFC2. Each cyclone's exhaust is directed to BHS.				100	51,100	0.5	12.8	0.04	1.0	0.0001	0.0038
Pneumatic conveyance of wood residue from Lines No. 1 and No. 2 sizing and screening to TBC. Cyclone exhaust is directed to BHS.				6	3,066	0.5	0.8	0.04	0.1	0.0001	0.0002
Pneumatic conveyance of finish sawing exhaust to BHS. (Uncontrolled EF does not reflect use of cyclone as wood residue does not travel through one en route to BHS.)				3	1,533	2000	1,533	0.04	0.03	0.6	0.5
Pneumatic conveyance of wood residue from Lines No. 1 and No. 2 screening to FC. Cyclone exhaust is directed to BHS.				2	1,022	0.5	0.3	0.04	0.02	0.0001	0.0001
MHS controlled by BHS Subtotal (tpy)		PM/PM_{10}/$PM_{2.5}$:	131.4		61,831	PM:	1,547		1.1	0.01501	0.464
Pneumatic conveyance of wood residue (material reject) from F1 to FR1. Cyclone exhaust is directed to BH1.	BH1 / Clarks 57-20	40000	150.2	2.0	1,022	0.5	0.3	0.04	0.02	0.00002	0.00001
Pneumatic conveyance of wood residue from Line No. 1 hog to CR1. Cyclone exhaust is directed to BH1.				1.5	767	0.5	0.2	0.04	0.02	0.00002	0.00001
MR1 controlled by BH1 Subtotal (tpy)		PM/PM_{10}/$PM_{2.5}$:	150.2		1,788.5	PM:	0.4		0.04	0.00002	0.00002
Pneumatic conveyance of wood residue (material reject) from F2 to FR2. Cyclone exhaust is directed to BH2.	BH2 / Clarks 57-20	26000	97.6	2.0	1,022	0.5	0.3	0.04	0.02	0.00002	0.00001
Pneumatic conveyance of wood residue from Line No. 2 hog to BH2. (Uncontrolled EF does not reflect use of cyclone as wood residue does not travel through one en route to BH2.)				1.5	767	2000	767	0.04	0.02	0.1	0.03
Pneumatic conveyance of finish sanding exhaust to BH2. (Uncontrolled EF does not reflect use of cyclone as wood residue does not travel through one en route to BH2.) (This is MR2S for line 1)				3.0	1,533	2000	1,533	0.04	0.03	0.0800	0.06
MR2S controlled by BH2 Subtotal (tpy)		PM/PM_{10}/$PM_{2.5}$:	97.6		3,322	PM:	2,300		0.1	0.05539	0.092
TOTAL		PM/PM_{10}/$PM_{2.5}$:	379.2			PM:	3,847		1.2		0.556

Emissions Generating Activity	PM_{10} EF (lb/ODT)	PM_{10} PTE (tpy)	PM_{10} ORL "A" EF (lb/ODT)	PM_{10} ORL "A" PTE (tpy)	PM_{10} ORL "B" EF (lb/ODT)	PM_{10} ORL "B" PTE (tpy)	$PM_{2.5}$ EF (lb/ODT)	$PM_{2.5}$ PTE (tpy)	$PM_{2.5}$ ORL "A" EF (lb/ODT)	$PM_{2.5}$ ORL "A" PTE (tpy)	$PM_{2.5}$ ORL "B" EF (lb/ODT)	$PM_{2.5}$ ORL "B" PTE (tpy)
Pneumatic conveyance of wood residue (suspended in head space of silo?) from RMS to BHS. (The wood residue does not travel through cyclone en route to BHS.)	0.1	0.3	0.00398	0.0	0.00003	0.000	0.1	0.3	0.00396	0.0	0.00003	0.000
Pneumatic conveyance of wood residue from Lines No. 1 and No. 2 sizing and screening to PFC1 and PFC2. Each cyclone's exhaust is directed to BHS.	0.425	10.9	0.0398	1.0	0.00015	0.004	0.25	6.4	0.0396	1.0	0.00015	0.004
Pneumatic conveyance of wood residue from Lines No. 1 and No. 2 sizing and screening to TBC. Cyclone exhaust is directed to BHS.	0.425	0.7	0.0398	1.0	0.00015	0.0002	0.25	0.4	0.0396	0.1	0.00015	0.0002
Pneumatic conveyance of finish sawing exhaust to BHS. (Uncontrolled EF does not reflect use of cyclone as wood residue does not travel through one en route to BHS.)	2000	1,533	0.0398	0.03	0.6	0.5	2000	1,533	0.0396	0.03	0.6	0.5
Pneumatic conveyance of wood residue from Lines No. 1 and No. 2 screening to FC. Cyclone exhaust is directed to BHS.	0.425	0.2	0.0398	1.0	0.00015	0.0001	0.25	0.1	0.0396	0.02	0.00015	0.0001
MHS controlled by BHS Subtotal (tpy)	PM_{10}:	1,545		3.1	0.01501	0.464	$PM_{2.5}$:	1,540		1	0.01501	0.464
Pneumatic conveyance of wood residue (material reject) from F1 to FR1. Cyclone exhaust is directed to BH1.	0.425	0.2	0.0398	1.0	0.00002	0.00001	0.25	0.1	0.0396	0.02	0.00002	0.00001
Pneumatic conveyance of wood residue from Line No. 1 hog to CR1. Cyclone exhaust is directed to BH1.	0.425	0.2	0.0398	1.0	0.00002	0.00001	0.25	0.1	0.0396	0.02	0.00002	0.00001
MR1 controlled by BH1 Subtotal (tpy)	PM_{10}:	0.4		2.0	0.00002	0.00002	$PM_{2.5}$:	0.2		0.04	0.00002	0.00002
Pneumatic conveyance of wood residue (material reject) from F2 to FR2. Cyclone exhaust is directed to BH2.	0.425	0.2	0.0398	0.02	0.00002	0.00001	0.25	0.1	0.0396	0.02	0.00002	0.00001
Pneumatic conveyance of wood residue from Line No. 2 hog to BH2. (Uncontrolled EF does not reflect use of cyclone as wood residue does not travel through one en route to BH2.)	2000	766.5	0.0398	0.02	0.1	0.03	2000	767	0.0396	0.02	0.1	0.03
Pneumatic conveyance of finish sanding exhaust to BH2. (Uncontrolled EF does not reflect use of cyclone as wood residue does not travel through one en route to BH2.) (This is MR2S for line 1)	2000	1,533.0	0.0398	0.03	0.1	0.06	2000	1,533	0.0396	0.03	0.1	0.1
MR2S controlled by BH2 Subtotal (tpy)	PM_{10}:	2,300		0.1	0.05539	0.092	$PM_{2.5}$:	2,300		0.1	0.05539	0.092
TOTAL	PM_{10}:	3,845		5.2		0.556	$PM_{2.5}$:	3,840		1.2		0.556

Emissions Generating Activity	Formaldehyde EF (lb/ODT)	Formaldehyde PTE (tpy)	Methanol EF (lb/odt or lb/msf 3/4")	Methanol PTE (tpy)	Phenol EF (lb/odt or lb/msf 3/4")	Phenol PTE (tpy)	VOC EF (lb/odt or lb/msf 3/4")	VOC PTE (tpy)
Pneumatic conveyance of wood residue (suspended in head space of silo?) from RMS to BHS. (The wood residue does not travel through cyclone en route to BHS.)	-	-	0.0016	0.00	-	-	0.5017	1.3
Pneumatic conveyance of wood residue from Lines No. 1 and No. 2 sizing and screening to PFC1 and PFC2. Each cyclone's exhaust is directed to BHS.	-	-	0.0016	0.04	-	-	0.5017	12.8
Pneumatic conveyance of wood residue from Lines No. 1 and No. 2 sizing and screening to TBC. Cyclone exhaust is directed to BHS.	-	-	0.0016	0.002	-	-	0.5017	0.8
Pneumatic conveyance of finish sawing exhaust to BHS. (Uncontrolled EF does not reflect use of cyclone as wood residue does not travel through one en route to BHS.)	-	-	0.480	0.37	0.196	0.15	0.558	0.43
Pneumatic conveyance of wood residue from Lines No. 1 and No. 2 screening to FC. Cyclone exhaust is directed to BHS.	-	-	0.0016	0.001	-	-	0.5017	0.3
MHS controlled by BHS Subtotal (tpy)		0.0	0.0135	0.4	0.1960	0.2	0.50313	15.555
Pneumatic conveyance of wood residue (material reject) from F1 to FR1. Cyclone exhaust is directed to BH1.	0.104	0.05	0.448	0.23	-	-	0.552	0.28
Pneumatic conveyance of wood residue from Line No. 1 hog to CR1. Cyclone exhaust is directed to BH1.	-	-	0.480	0.18	0.196	0.08	0.558	0.21
MR1 controlled by BH1 Subtotal (tpy)	0.1036	0.1	0.4617	0.4	0.1960	0.1	0.55418	0.496
Pneumatic conveyance of wood residue (material reject) from F2 to FR2. Cyclone exhaust is directed to BH2.	0.104	0.05	0.448	0.23	-	-	0.552	0.28
Pneumatic conveyance of wood residue from Line No. 2 hog to BH2. (Uncontrolled EF does not reflect use of cyclone as wood residue does not travel through one en route to BH2.)	-	-	0.480	0.18	0.196	0.08	0.558	0.21
Pneumatic conveyance of finish sanding exhaust to BH2. (Uncontrolled EF does not reflect use of cyclone as wood residue does not travel through one en route to BH2.) (This is MR2S for line 1)	0.0110	0.21	0.0194	0.38	-	-	0.0303	0.59
MR2S controlled by BH2 Subtotal (tpy)	0.1602	0.3	0.4757	0.8	0.1960	0.1	0.65381	1.086
TOTAL		0.3		1.6		0.3		17.14

[1] Assumed value provided by applicant

Oregon Department of Environmental Quality's AQ-EF02 entitled, "Emission Factors - Wood Products." August 1, 2011.

Pneumatic Conveyance Process Equipment	Description	EF (lb/odt)
Cyclone - wood residue other than sanderdust	Medium Efficiency	0.5
	High Efficiency	0.2
	Baghouse Control	0.001
Cyclone - sanderdust	High Efficiency	2.0
	Baghouse Control	0.04
Target Box	-	0.1

Oregon Department of Environmental Quality's AQ-EF03 entitled, "Emission Factors - Wood Products - $PM_{10}/PM_{2.5}$ Fraction." August 1, 2011.

Type of Control	PM_{10} Fraction of PM	$PM_{2.5}$ Fraction of PM
	Cyclones & Process Equipment	
Uncontrolled		
Bag filter system	99.5	99
Cyclone - high efficiency	95	80
Cyclone - medium efficiency	85	50

Device Name	Make/Model	Control Efficiency[1] (%)
Sizer Baghouse (BHS)	Carter Day 375 RF10	99.97
Line 1 Former Baghouse	Carter Day 156 RF10	99.97
Line 2 Former Baghouse	Carter Day 156 RF10	99.97
Main Waste Baghouse 1 (BH1)	Clarks 57-20	99.996
Main Waste Baghouse 2 (BH2)	Clarks 57-20	99.996

[1] manufacturer's specifications

Emission Generating Activity: Pneumatic Conveyance of Sanderdust

NCASI Technical Bulletin No. 770 entitled, "Volatile Organic Compound Emissions from Wood Products Manufacturing Facilities." January 1999.

Pollutant	Run No.	100-1SD1 (lb/msf 3/4" 1 side)	100-2SD1 (lb/msf 3/4" 1 side)	Total (lb/msf 3/4" 1 side)	EF (lb/msf 3/4" throughput)
Formaldehyde	1	0.00058	0.0015	0.00208	0.0110
	2	0.0013	0.00088	0.0022	
	3	0.0023	0.004	0.0063	
			90th percentile value:	0.0055	
Methanol	1	0.0021	0.0028	0.0049	0.0194
	2	0.0024	0.0033	0.0057	
	3	0.0044	0.0063	0.0107	
			90th percentile value:	0.0097	

Emission Generating Activity: Non-Blowline Blend UF Core Former Exhaust

NCASI Technical Bulletin No. 770 entitled, "Volatile Organic Compound Emissions from Wood Products Manufacturing Facilities." January 1999.

Pollutant	Run No.	100-1FO1 (lb/odt)
Formaldehyde	1	0.12
	2	0.022
	3	0.038
	90th percentile value:	0.104
Methanol	1	0.40
	2	0.38
	3	0.46
	90th percentile value:	0.448

Emission Generating Activity: Pneumatic Conveyance of Sawdust & Hogged Trim

NCASI Technical Bulletin No. 770 entitled, "Volatile Organic Compound Emissions from Wood Products Manufacturing Facilities." January 1999.

Pollutant	Run No.	132-1WR1 lb/odt	132-1WR1 lb/odt (as propane RM25A)
Methanol	1	0.045	0.010
	2	0.56	0.128
	3	0.16	0.037
	EF (90th percentile value):	0.480	
Phenol	1	0.1	0.086
	2	0.21	0.180
	3	0.14	0.120
	EF (90th percentile value):	0.196	
VOC (as carbon)	1	0.056	0.069
	2	0.15	0.184
	3	0.054	0.066
WPP1 VOC	1	0.117	
	2	0.645	
	3	0.209	
	EF (90th percentile value):	0.558	

Reference Information

Element and Compound Information

Element / Compound	FID RF	MW (lb/lb-mol)	Formula	Carbon Atoms	Hydrogen Atoms	Oxygen Atoms
Methanol	0.5	32.0420	CH_4O	1	4	1
Phenol	0.9167	94.1128	C_6H_6O	6	6	1
Propane	1	44.0962	C_3H_8	3	8	0
Carbon	-	12.0110	C	1	-	-
Hydrogen	-	1.0079	H	-	1	-
Oxygen	-	15.9994	O	-	-	1

FID RF = ECN / No. carbon atoms in compound. See Attachment No. 2 to NCASI's September 2011 Technical Bulletin No. 991 (TB768) - Volatile Organic Compound Emissions from Wood Products Manufacturing Facilities Part I - Plywood. In the absence of information related to the FID NCASI employed to conduct RM25A testing, empirical effective carbon number (ECN) values will be employed to estimate FID RF.

ECN = (no. aliphatic carbon) + (no. aromatic carbon) - (no. ether oxygen) - (0.5 x no. primary alcohol oxygen)

Calculations to estimate ECN for several compounds:

Element / Compound	Formula	No. Aliphatic Carbon	No. Aromatic Carbon	No. Carbonyl Carbon	No. Carboxyl Carbon	No. Ether Oxygen	No. Primary Alcohol Oxygen	Empirical ECN
Methanol	CH_3OH	1					1	0.5
Phenol	C_6H_5OH		6				1	5.5
Propane	C_3H_8	3						3

BH1: main waste baghouse no. 1
BH2: main waste baghouse no. 2
BHS: sizer baghouse
CR1: chip bin cyclone for line no. 1
EF: emission factor
FC: fines cyclone
F1: former for line no. 1
F2: former for line no. 2
FR1: recycle cyclone for line no. 1
FR2: recycle cyclone for line no. 2
ORL: owner requested limit
PFC1: plug feeder cyclone for line no. 1
PFC2: plug feeder cyclone for line no. 2
RMS: raw material storage
TBC: truck bin cyclone

Emission Generating Activity: Pneumatic Conveyance of Green Wood Residue

Volatile Organic Compounds

Residue Type	Species	Harvest Season	Number of One-Hour Runs	Arithmetic Average of Hourly (lb C/odt)	Standard Deviation (lb C/odt)	Range of Hourly Average (lb C/odt)	Arithmetic Average (informational (lb C/odt)	Arithmetic Average + Two (lb C/odt)	Average 95th Percentile Value (lb C/odt)	WPP1 VOC (lb/odt)
Sawdust	DF	Fall	34	0.13	0.03	0.04 - 0.18	0.12	0.18	0.195	0.2386
		Spring	58	0.11	0.05	0.05 - 0.37		0.21		
Planer Shavings	DF	Fall	44	0.09	0.04	0.04 - 0.21	0.11	0.17	0.22	0.2692
		Spring	63	0.13	0.07	0.04 - 0.37		0.27		
Chips	DF	Fall	75	0.04	0.01	0.01 - 0.07	0.04	0.06	0.06	0.0734
		Spring	150	0.04	0.01	0.01 - 0.07		0.06		
Chips	PP	Fall	49	0.35	0.03	0.26 - 0.41	0.35	0.41	0.41	0.5017

Reference: September 1996 NCASI Technical Bulletin No. 723 entitled, "Laboratory and Limited Field Measurements of VOC Emissions from Wood Residuals," Table 7 on page 27.

Hazardous Air Pollutants: Methanol

Residue Type	Species	Harvest Season	Sampling Period (hr)	Methanol (lb/odt)
Chips	Aspen (hardwood)	Spring	1	0.00083
			1	0.0016
			2-run higher value	0.0016
			2-run average value (informational purposes only)	0.0012

Reference: January 1999 NCASI Technical Bulletin No. 773 entitled, "Volatile Organic Compound Emissions from Wood Products Manufacturing Facilities, Part VI - Hardboard and Fiberboard," Source ID No. 072-1LC1, page B46.

Reference Information

Element and Compound Information

Element / Compound	MW (lb/lb-mol)	Formula	Carbon Atoms	Hydrogen Atoms	Oxygen Atoms
Propane	44.0962	C_3H_8	3	8	0
Carbon	12.0110	C	1	-	-
Hydrogen	1.0079	H	-	1	-
Oxygen	15.9994	O	-	-	1

Abbreviations/Acronyms

DE: dryer exit
DF: douglas fir
ECN: effective carbon number
FID: flame ionization detector (aka THC analyzer)
GC/FID: gas chromatograph with a flame ionization detector

GC/MS: gas chromatograph with a mass spectrometer
HZ: heating zone
J: jet
L: longitudinal

MSF: one thousand square feet
MW: molecular weight
NCASI: National Council for Air and Stream Improvement
PF: phenol formaldehyde
PP: ponderosa pine
RM25A: EPA Reference Method 25A
RF: THC analyzer response factor
RM25A: EPA Reference Method 25A
THC: total hydrocarbon
WF: white fir
WPP1 VOC: EPA Interim VOC Measurement Protocol for the Wood Products Industry - July 2007

Non-HAP Potential to Emit

Emission Unit: **WRD**
Description: Wood residue drops
ORL on Fiber Throughput: 51,100 odt/yr January 29, 2016 fiber throughput ORL to establish synthetic minor HAP source

NON-FUGITIVE EMISSIONS

Potential to Emit, (tons per year)

Emissions Generating Activity	Portion of Total Throughput[1] (%)	Stream Throughput (ODT/yr)	PM EF (lb/ODT)	PM PTE (tpy)	PM_{10} EF (lb/ODT)	PM_{10} PTE (tpy)	$PM_{2.5}$ EF (lb/ODT)	$PM_{2.5}$ PTE (tpy)	EF Reference
Drop wood residue from trailers onto a stationary surface at TD	100	51,100	0.0015	0.04	0.0007	0.02	0.0001	0.003	May 8, 2014 EPA memorandum entitled, "Particulate Matter Potential to Emit Emission Factors for Activities at Sawmills, Exclusing Boilers, Located in Pacific Northwest Indian Country." Assume wood residue has moisture content of 13%.
Drop wood residue via screening process	60	30,660	0.0015	0.02	0.0007	0.01	0.0001	0.002	
Drop wood residue from RMS onto a surface	100	51,100	0.0015	0.04	0.0007	0.02	0.0001	0.003	
Drop wood residue from TBC into TB	3	1,533	0.0015	0.001	0.0007	0.001	0.0001	0.0001	
Drop wood residue from CBC into CB	0.75	383	0.0015	0.000	0.0007	0.0001	0.0001	0.0000	
TOTAL			PM:	0.1	PM_{10}:	0.05	$PM_{2.5}$:	0.01	

[1] Assumed value provided by applicant

CB: chip bin
CBC: chip bin cyclone
RMS: raw material storage
TB: truck bin
TBC: truck bin cyclone
TD: truck dump

Non-HAP Potential to Emit

Emission Unit:	**FPE**	
Description:	Detroit Diesel (General Motors) Model 6061A (671), Unit 6A - 16066	
	Engine supplies mechanical work to water pump for fire suppression in the event facility loses electricity in an emergency.	
	The pump is programmed to start and run for 18 minutes, once per week, for an actual operation of 15.6 hours per year.	
Control Device:	none	
Fuel:	No. 2 Distillate Oil	
Design Maximum Power Output:	188	horsepower
Design Maximum Heat Input Capcity:	1.316	MMBtu/hr[1]
Operation:	100	hours per year[2]

NON-FUGITIVE EMISSIONS

Potential to Emit, (tons per year)

Criteria Pollutant Emissions	EF (lb/MMBtu)	PTE (tpy)	EF Reference
Carbon Monoxide (CO)	0.95	0.1	1
Lead (Pb)	2.9E-05	0.000002	2
Nitrogen Oxides (NO_X)	4.41	0.3	1
Particulate Matter (PM)	0.1974	0.01	3
Particulate Matter (PM_{10})	0.1974	0.01	3
Particulate Matter ($PM_{2.5}$)	0.1974	0.01	3
Sulfur Dioxide (SO_2)	0.50357	0.03	4
Volatile Organic Compounds (VOC)	0.36	0.02	1

Greenhouse Gas Emissions (CO_2 Equivalent)	EF (lb/MMBtu)	PTE (tpy)	EF Reference
Carbon Dioxide (CO_2)	163.054	10.7	5
Methane (CH_4)	0.165	0.01	5
Nitrous Oxide (N_2O)	0.394	0.03	5
TOTAL		10.8	

[1] Heat Input = Power Output (MMBtu/hr) X Average BSFC (Btu/hp-hr) X (MMBtu/1x10^6 Btu), where BSFC stands for brake-specific fuel consumption. See footnote A of Table 3.3-1 of AP-42, October 1996. 1.316 MMBtu/hr = (188 hp-hr) X (7,000 Btu/hp-hr) X (MMBtu/1x10^6 Btu)

[2] 40 CFR § 63.6640(f)(2)

EF Reference	Description
1	Table 3.3-1 of AP-42, October 1996.
2	Locating and Estimating Air Emissions from Sources of Lead and Lead Compounds, EPA-454/R-98-006, May 1998, pg 5-45.
3	Basis: FARR combustion source stack PM emission limit of 0.1 gr/dscf corrected to 7% O_2 at 40 CFR 49.125(d)(1) EF (lb/MMBtu) = FARR PM Limit (gr/dscf@7%O_2) X $CF_{7\rightarrow 0\%O2}$ X F_d (dscf/MMBtu) / $CF_{gr\rightarrow lb}$ (gr/lb) • $CF_{7\rightarrow 0\%O2}$ = (20.9 - X_{O2Fd}) / (20.9 - X_{O2FARR}). To create a correction factor that adjusts the basis of the FARR emission limit from 7% O_2 to 0% O_2 (the basis for F_d), X_{O2Fd} = 0 and X_{O2FARR} = 7. The value 20.9 is the percent by volume of the ambient air that is O_2. Decreasing the O_2 from the FARR baseline increases the pollutant concentration. See Equation 19-1 of EPA Method 19 at Appendix A-7 to 40 CFR Part 60. • F_d = 9,190 dscf/MMBtu for combustion of oil. See Table 19-2 of EPA Method 19 at Appendix A-7 to 40 CFR Part 60. FARR PM Calculated EF (lb/MMBtu): 0.1974; FARR PM Emission Limit (gr/dscf @7%O_2): 0.1; $CF_{7\rightarrow 0\%O2}$ (unitless): 1.504; F_d (dscf/MMBtu): 9,190; $CF_{gr\rightarrow lb}$ (gr/lb): 7,000 • Assume $PM_{2.5}$ = PM_{10} = PM
4	Option 1: 0.50357 lb/MMBtu. This emission factor is employed to determine PTE as it limits emissions to less than Option 2 below. Basis: FARR distillate fuel oil No. 2 sulfur limit of 0.5% by weight at 40 CFR 49.130(d)(2) EF (lb/MMBtu) = [FARR Fuel S Limit (%S) / 100] X $CF_{S\rightarrow SO2}$ X $CF_{lb\rightarrow gal}$ (lb/gal) X $CF_{Btu\rightarrow MMBtu}$ (Btu/MMBtu) / $CF_{gal\rightarrow Btu}$ (Btu/gal) • $CF_{S\rightarrow SO2}$ = 2 lb SO_2/lb S. S + O_2 → SO_2. For every 1 mol S (16 lb/lb-mol) reactant, there is 1 mol SO_2 (32 lb/lb-mol) product. 32 / 16 = 2. • $CF_{lb\rightarrow gal}$ = 7.05 lb/gal fuel. See weight of distillate oil on page A-6 of Appendix A to AP-42, September 1985. • $CF_{gal\rightarrow Btu}$ = 140,000 Btu/gal fuel. See heating value of distillate oil on page A-5 of Appendix A to AP-42, September 1985. FARR Fuel S Calculate SO_2 EF (lb/MMBtu): 0.50357; FARR Fuel Sulfur Limit (% by weight): 0.5; $CF_{S\rightarrow SO2}$ (lb SO_2/lb S): 2; $CF_{lb\rightarrow gal}$ (lb/gal fuel): 7.05; $CF_{gal\rightarrow Btu}$ (Btu/gal fuel): 140,000; $CF_{Btu\rightarrow MMBtu}$ (Btu/MMBtu): 1.E+06 Option 2: 1.147 lb/MMBtu. Basis: FARR combustion source stack SO_2 emission limit of 500 parts per million by volume dry basis (ppmvd) corrected to 7% O_2 at 40 EF (lb/MMBtu) = FARR SO_2 Limit (ppmvd@7%O_2) X $CF_{7\rightarrow 0\%O2}$ X $CF_{ppm\rightarrow lb/dscfSO2}$ X F_d (dscf/MMBtu) • $CF_{7\rightarrow 0\%O2}$ = (20.9 - X_{O2Fd}) / (20.9 - X_{O2FARR}). To create a correction factor that adjusts the basis of the FARR emission limit from 7% O_2 to 0% O_2 (the basis for F_d), X_{O2Fd} = 0 and X_{O2FARR} = 7. The value 20.9 is the percent by volume of the ambient air that is O_2. Decreasing the O_2 from the FARR baseline increases the pollutant concentration. See Equation 19-1 of EPA Method 19 at Appendix A-7 to 40 CFR Part 60. • $CF_{ppm\rightarrow lb/dscfSO2}$ = 1.660 X 10^{-7} lb SO_2/dscf / ppm SO_2. See Table 19-1 of EPA Method 19 at Appendix A-7 to 40 CFR Part 60. • F_d = 9,190 dscf/MMBtu for combustion of oil. See Table 19-2 of EPA Method 19 at Appendix A-7 to 40 CFR Part 60. FARR 500 ppm Calculate SO_2 EF (lb/MMBtu): 1.147; FARR SO_2 Emission Limit (ppmvd@7%O_2): 500; $CF_{7\rightarrow 0\%O2}$ (unitless): 1.504; $CF_{ppm\rightarrow lb/dscfSO2}$ (lb/dscf / ppm): 1.66E-07; F_d (dscf/MMBtu): 9190
5	EPA's March 2011 guidance document "PSD and Title V Permitting Guidance for Greenhouse Gases" states that the GHG Report Rule (40 CFR 98), "should be considered a primary reference for sources and permitting authorities in estimating GHG emissions and establishing measurement techniques when preparing or processing permit applications." Therefore, GHG Reporting Rule emission factors will be employed to determine GHG PTE. Carbon Dioxide (CO_2) EF (lb CO_2e/MMBtu) = EF (kg CO_2/MMBtu) X $CF_{kg\rightarrow lb}$ (lb/kg) X GWP_{CO2} (lb CO_2e/lb CO_2) Calculated CO_2e EF for CO_2 (lb CO_2e/MMBtu): 163.054; 40 CFR 98 Table C-2 EF (kg CO_2/MMBtu): 73.96; $CF_{kg\rightarrow lb}$ (lb/kg): 2.20462262; 40 CFR 98 Table A-1 GWP_{CO2} (lb CO_2e/lb CO_2): 1 Methane (CH_4) EF (lb CO_2e/MMBtu) = EF (kg CH_4/MMBtu) X $CF_{kg\rightarrow lb}$ (lb/kg) X GWP_{CH4} (lb CO_2e/lb CH_4) Calculated CO_2e EF for CH_4 (lb CO_2e/hp-hr): 0.165; 40 CFR 98 Table C-2 EF (kg CH_4/MMBtu): 0.003; $CF_{kg\rightarrow lb}$ (lb/kg): 2.20462262; 40 CFR 98 Table A-1 GWP_{CO2} (lb CO_2e/lb CH_4): 25 Nitrous Oxide (N_2O) EF (lb CO_2e/MMBtu) = EF (kg N_2O/MMBtu) X $CF_{kg\rightarrow lb}$ (lb/kg) X GWP_{N2O} (lb CO_2e/lb N_2O) Calculated CO_2e EF for N_2O (lb CO_2e/hp-hr): 0.394; 40 CFR 98 Table C-2 EF (kg N_2O/MMBtu): 0.0006; $CF_{kg\rightarrow lb}$ (lb/kg): 2.20462262; 40 CFR 98 Table A-1 GWP_{CO2} (lb CO_2e/lb N_2O): 298

HAP Potential to Emit

Emission Unit:	**FPE**	
Description:	Detroit Diesel (General Motors) Model 6061A (671), Unit 6A - 16066 Engine supplies mechanical work to water pump for fire suppression in the event facility loses electricity in an emergency. The pump is programmed to start and run for 18 minutes, once per week, for an actual operation of 15.6 hours per year.	
Control Device:	none	
Fuel:	No. 2 Distillate Oil	
Design Maximum Power Output:	188	horsepower
Design Maximum Heat Input Capcity:	1.316	MMBtu/hr[1]
Operation:	100	hours per year[2]

Potential to Emit, (tons per year)

Hazardous Air Pollutants	EF (lb/MMBtu)	PTE (tpy)
Acetaldehyde	7.67E-04	9.49E-05
Acrolein	9.25E-05	1.14E-05
Benzene	9.33E-04	1.15E-04
1,3-Butadiene	3.91E-05	4.84E-06
Formaldehyde	1.18E-03	1.46E-04
Naphthalene[3]	8.48E-05	1.05E-05
Polycyclic Organic Matter (POM)[4]	1.63E-04	2.02E-05
Toluene	4.09E-04	5.06E-05
Xylenes	2.85E-04	3.53E-05
TOTAL[5]	3.9E-03	4.8E-04

EF Basis: AP-42, October 1996. Table 3.3-2. Although the engine is subject to RICE MACT (NESHAP ZZZZ), no emission limits apply.

[1] Heat Input = Power Output (MMBtu/hr) X Average BSFC (Btu/hp-hr) X (MMBtu/1x10^6 Btu), where BSFC stands for brake-specific fuel consumption. See footnote A of Table 3.3-1 of AP-42, October 1996. 1.316 MMBtu/hr = (188 hp-hr) X (7,000 Btu/hp-hr) X (MMBtu/1x10^6 Btu)

[2] 40 CFR § 63.6640(f)(2)

[3] Naphthalene is a HAP that is subject individually to the 10 tpy major source threshold, but that is also one of several polycyclic organic matter (POM) compounds that, in aggregate, are subject to the same 10 tpy major source threshold.

[4] See table below for list of individual polycyclic organic matter (POM) compounds. POM defines a broad class of compounds that generally includes all organic structures having two or more fused aromatic rings (i.e., rings that share a common border), and that have a boiling point greater than or equal to 212°F (100°C). See http://www.epa.gov/ttn/atw/hlthef/polycycl.html#ref11

[5] Because naphthalene are accounted for individually and in the calculation of POM EF, their individual contribution here is discounted so as to avoid double-counting.

POM Compounds	EF (lb/MMBtu)
Acenaphthene*	1.42E-06
Acenaphthylene*	5.06E-06
Anthracene*	1.87E-06
Benzo(a)anthracene*	1.68E-06
Benzo(b)fluoranthene*	9.91E-08
Benzo(k)fluoranthene*	1.55E-07
Benzo(g,h,l)perylene*	4.89E-07
Benzo(a)pyrene*	1.88E-07
Benzo(e)pyrene*	2.60E-09
Chrysene*	3.53E-07
Dibenzo(a,h)anthracene*	5.83E-07
Fluoranthene*	7.61E-06
Fluorene*	2.92E-05
Indeno(1,2,3-cd)pyrene*	3.75E-07
Naphthalene*,**	8.48E-05
Phenanthrene*	2.94E-05
SUBTOTAL	1.63E-04

EF Basis: AP-42, October 1996. Table 3.3-2. Although the engine is subject to RICE MACT (NESHAP ZZZZ), no emission limits apply.

* designates a polycyclic aromatic hydrocarbon (PAH). PAHs are potent atmospheric pollutants that consist of fused aromatic rings and do not contain heteroatoms or carry substituents. See http://en.wikipedia.org/wiki/Polycyclic_aromatic_hydrocarbon#PAH_compounds

** designates a POM compound that is also an individual HAP.

Non-HAP Potential to Emit

Emission Unit: **DT**
Description: 10,000 gallon horizontal diesel fuel oil storage tank supplying fuel to two oil-fired boilers
Control Device: none

NON-FUGITIVE EMISSIONS
Potential to Emit, (tons per year)

Criteria Pollutant Emissions	PTE (tpy)
Volatile Organic Compounds (VOC)	0.007

The following information was submitted by applicant:

	Losses, pounds per year			Tons per
Contents	Working	Breathing	Total	Year
Fuel Oil No. 2	10.02	4.64	14.66	0.00733

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Neucor Fuel Tank - Horizontal Tank
Yakima, Washington

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	10.02	4.64	14.66

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Neucor Fuel Tank
City:	Yakima
State:	Washington
Company:	Neucor
Type of Tank:	Horizontal Tank
Description:	No. 2 diesel tank feeding the two steam boilers at the facility.

Tank Dimensions

Shell Length (ft):		26.60
Diameter (ft):		8.00
Volume (gallons):		10,000.00
Turnovers:		104.00
Net Throughput(gal/yr):		1,040,000.00
Is Tank Heated (y/n):	N	
Is Tank Underground (y/n):	N	

Paint Characteristics

Shell Color/Shade:	Red/Primer
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Yakima, Washington (Avg Atmospheric Pressure = 14.18 psia)

Physical Characteristics, Horizontal Fixed Roof Tank			
Facility Name:		**Facility Location:**	
Neucor		Yakima, Washington	
Dimensions		**Shell Characteristics**	
Shell Length (ft):	26.6	*Shell Color/Shade (choose one)*	
Shell Diameter (ft):	8	White/White	Gray/Light
Working Volume (gal):	10,000	Aluminum/Specular	Gray/Medium
Turnovers per Year:	104	Aluminum/Diffuse	Red/Primer
Net Throughput (gal/yr):	1,040,000		
Heated (Y/N):	N	*Shell Condition (choose one)*	
Tank Underground (Y/N):	N	Good	Poor
Breather Vent Settings		**Tank Contents**	
Vacuum Setting (psig):	0.03	Distillate Oil, #2	
Pressure Setting (psig):	0.03		
Form Completed By:		**Title:**	**Date Completed**
Will Savage		Director of Manufactur	12/11/2014
Email		Phone	
wksavage@neucorpanels.com		(509)985-9627	+

Permit Analysis

Appendix B: Air Quality Impact Analysis

Minor New Source Review Permit

Neucor, Incorporated

Yakama Reservation
White Swan, Washington

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
5 POST OFFICE SQUARE, SUITE 100
BOSTON, MA 02109-3912

MAR 09 2016

MEMORANDUM

TO: Doug Hardesty, EPA Region 10, Permit Engineer

FROM: Leiran Biton, EPA Region 1, Permit Modeling Contact

SUBJECT: Recommendation for Air Quality Impact Analysis (AQIA) pursuant to the Application for New Construction, Federal Minor New Source Review Program in Indian Country; Neucor, 3592 Wesley Road, White Swan, Washington

On January 29, 2016, Neucor submitted an application to EPA Region 10 for a permit to construct and operate a new source under the Federal Minor New Source Review Program in Indian Country. The application did not include an Air Quality Impact Analysis (AQIA). Federal Minor New Sources Regulations (40 CFR 49.159(d)) require that an AQIA be performed if there is a reason to be concerned that the proposed source would cause or contribute to a violation of the National Ambient Air Quality Standard (NAAQS) or Prevention of Significant Deterioration (PSD) increment.

Through an agreement with EPA Region 10, I have been working to determine whether there is sufficient reason to be concerned about the potential air impacts from the proposed source that an AQIA would be required. To determine whether there is reason for concern, I have reviewed the technical and operational details included in the application, and have also performed additional supplementary analysis to evaluate the potential impacts from the proposed source.

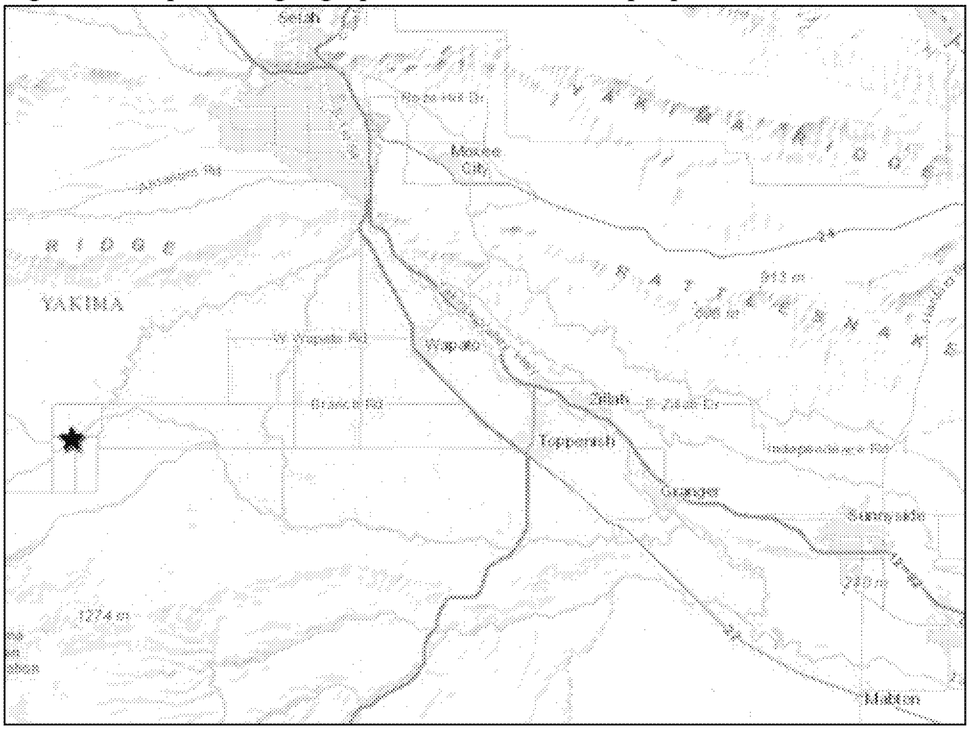
The purpose of this memorandum is to describe my analysis, results, and conclusion, and to make a recommendation for whether an AQIA should be required for the proposed source. In the sections below, I present information pertinent to my analysis of the potential impacts from the facility in developing my recommendation.

Geography and terrain

The proposed source would be located in White Swan, Washington, which is located on the Yakama Reservation in the Lower Yakima Valley. The Yakima Valley is divided into two sections—the Upper Yakima Valley to the north and the Lower Yakima Valley to the south—by the Ahtanum Ridge and Rattlesnake Hills, which run east-west across the Yakima Valley. White Swan is in the western, less populated area of the valley. The city of Toppenish, Washington, the largest population center in the Lower Yakima Valley, is located approximately 33 km to the east of the proposed source. The city of Yakima, Washington is located approximately 28 km to the northeast of the proposed source. The terrain of the western Lower Yakima Valley slopes gently from the west down to the east, and there are steep geographic features bounding the valley to the north, south, and west. Toppenish lies in one of the lowest elevation areas of the Lower Yakima Valley, with terrain increasing in elevation to both the west and east.

A map of the geographic area around the location of the proposed source is presented in Figure 1, with the location of the proposed source marked.

Figure 1. Map of the geographic area around the proposed source



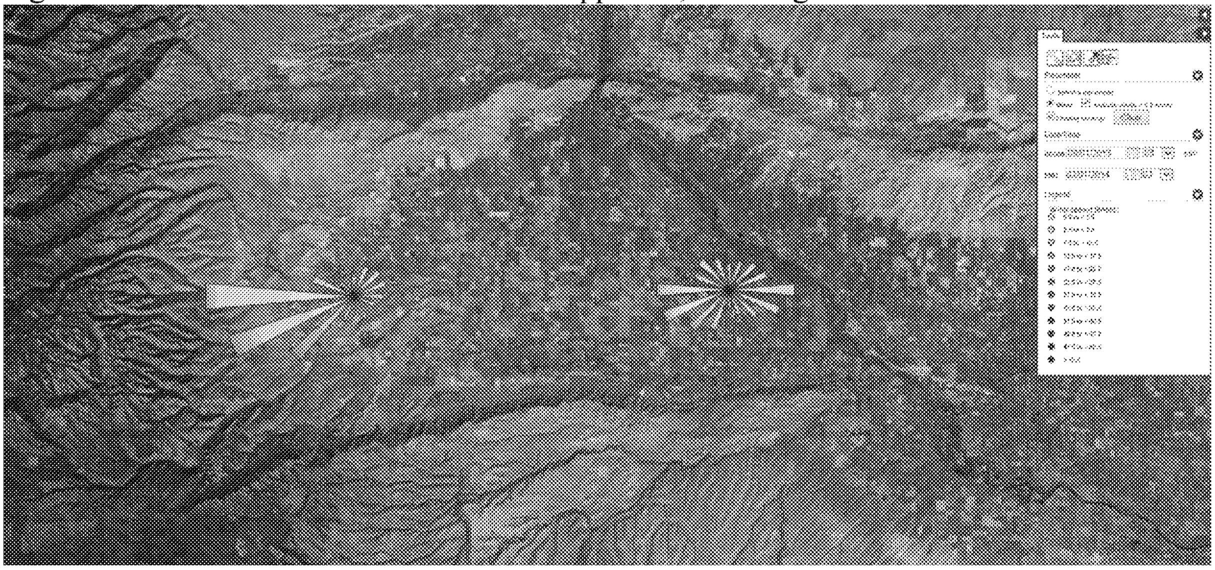
Sources: Esri, HERE, DeLorme, USGS, NGA, EPA, USDA, NPS, U.S. Forest Service

Meteorology

Meteorology in the Yakima Valley is heavily influenced by the surrounding terrain, primarily the Cascade Range immediately to the west. Weather patterns include frequent thermal inversions and periods of stagnation, especially during fall and winter months. Periods of stagnation of several weeks during the fall and winter are common. Wind speeds during these periods tend to be very low, and air generally follows gravitational flows from the western portions of the valley to the east, i.e., from White Swan to Toppenish.

Figure 2 displays wind roses for the period of September 1, 2013 to March 1, 2014 for White Swan and Toppenish. These wind roses demonstrate the generally low wind speeds and prevailing wind directions for White Swan (dominated by low wind speeds from the west) and Toppenish (dominated by low wind speeds from both the west and east).

Figure 2. Wind roses for White Swan and Toppenish, Washington



Source: AirNowTech

Existing air quality

Air quality in the Yakima Valley is adversely impacted by stagnant meteorological events, pollutant-trapping terrain that effectively serve as boundaries during stagnation events, and high emission heating devices that are prevalent throughout the communities that inhabit the region. The area is home to many older, higher-polluting wood-fueled heating devices for residential and commercial application (YRCAA 2015). Fine particulate matter emissions from these devices are significantly higher than more modern, fuel-efficient wood or oil boilers.

The primary air pollutant of concern in the Yakima Valley is fine particulate matter ($PM_{2.5}$). Monitoring stations in Yakima and Toppenish have indicated that design values may be trending above the national ambient air quality standard (NAAQS) for 24-hour average $PM_{2.5}$ concentrations, and the YRCAA has initiated participation in the PM Advance program to reduce $PM_{2.5}$ concentrations and potentially avoid a nonattainment designation. Levels in Yakima appear to be declining due to emission reduction efforts in the region, including a curtailment program (i.e., burn ban) for uncertified wood-burning devices and outdoor wood burning. However, levels in Toppenish appear to be increasing recently despite these efforts. The monitor in Toppenish cannot be used for classification as nonattainment because it is a non-Federal Reference Method (FRM) monitor, but its design value has increased above the level of the NAAQS in recent years. Levels in at the White Swan monitor (also non-FRM) remain well below the NAAQS; according to a 2015 Network Assessment by the Washington State Department of Ecology (WADOE), the air quality monitor at White Swan is useful in determining the spatial extent of elevated $PM_{2.5}$ levels in the area.

During the stagnation periods, pollutants in each section of the Yakima Valley are essentially trapped until the inversion layer lifts, at which point, mixing between the sections may occur. Until the layer lifts completely, however, air remains trapped in the larger valley until the stagnation event entirely clears. During cold-weather stagnation periods, ambient $PM_{2.5}$ levels in

Toppenish typically increase, followed by increases in White Swan as pollutants fill the Lower Yakima Valley.

One unique feature of the $PM_{2.5}$ problem in the Yakima Valley is the importance of nitrate in $PM_{2.5}$ formation. According to the YAWNS final report (WSU 2014), there are elevated nitrate levels in wintertime $PM_{2.5}$ and may represent an additional target for $PM_{2.5}$ control. Nitrate is formed in the atmosphere through interaction between ammonia, which is available in abundance in the Yakima Valley because of widespread agricultural activities, and nitric acid, which may arise from NOx emissions (primarily from combustion emissions). The limiting factor in this reaction is NOx, and as such, significant new emissions of NOx must be scrutinized for their potential contribution to formation of secondary $PM_{2.5}$.

Although it is not as prevalent in Yakima Valley, the high levels of ammonia make the formation of sulfate from ambient SO_2 highly favorable. Because valley-wide emissions of SO_2 are very low, sulfate is generally not seen as a major contributor to elevated $PM_{2.5}$, but significant increases in SO_2 emissions would likely lead to elevated $PM_{2.5}$ levels as well.

Screening modeling

Because the proposed source would be operating in an airshed that is significantly impacted by existing sources, I decided that additional investigation was necessary to ensure that no adverse impacts would result from operation of the proposed source. Specifically, conservative screening modeling would help determine whether the proposed source would have the potential to contribute to the existing air quality issue in Toppenish. Per EPA guidance, I used AERSCREEN v15181 for the screening analysis, and prepared land-use data using AERSURFACE v13016. Table 1 and 2 below provides details of the screening modeling analysis and building downwash estimates, including inputs selected, for principal emissions from Phase I and II/III respectively of the planned operation at the proposed source. Specifically, these emissions are the Dryer 1 (without baghouse) for Phase I and Boiler 1 (wood boiler) for Phase II/III. Inputs used for the building downwash estimates were developed based on a site drawing supplied by the applicant.

AERSURFACE developed estimates for input into AERSCREEN for 12 radial sectors and 12 months at the location of the proposed source to estimate surface roughness length, albedo, and Bowen ratio using NLCD92 data as inputs. (Future refined modeling should use the location of the meteorological station rather than the source.)

Because the most important potential impacts would occur during periods of stagnation, when exhaust plumes from the proposed source would be likely to be terrain following, I performed the screening model simulation without terrain interaction. Refined modeling using terrain may decrease, but may possibly increase ambient concentrations, because of the complexity of the terrain in the region. However, for conservative analysis in the direction of Toppenish from White Swan, it is my judgment that it is an appropriate method to assume flat terrain because our primary concern is for terrain-following plumes in a region with down-slope gravity/drainage flow, as described in section 4.1 of the AERMOD Implementation Guide (EPA 2015). Future refined modeling, however, may rely on default modeling methods to properly capture the full impact of terrain.

Table 1. Input values used in AERSCREEN

Source	Dryer 1	Boiler 1
Source type	Horizontal release stack	Vertical release stack
Source emission rate (lb/hr)	6.121	2.649
Stack height (ft)	68	69.5
Stack inner diameter (in)	39	48
Plume exit temperature (°F)	140	300
Stack air flow rate (acfm)	39615	21310
Rural or urban	Rural	Rural

Table 2. Building downwash parameters used in AERSCREEN

Parameter	Dryer 1	Boiler 1
Building height (ft)	30	30
Max building dimension (ft)	545.5	545.5
Min building dimension (ft)	126	126
Building orientation to north (degrees)	90	90
Stack direction from center (degrees)	250	275
Stack distance from center (ft)	461	286

For each source, two results of the screening analysis are presented in Table 3. First, the near-field maximum calculated 24-hour concentration is presented for comparison against the 24-hour $PM_{2.5}$ NAAQS of 35 $\mu g/m^3$. These impacts incorporate current (2012-2014) estimates for 24-hour $PM_{2.5}$ design values (i.e., 98^{th} percentile value) for the White Swan monitor of 21.9 $\mu g/m^3$. Second, the calculated 24-hour concentration at a distance of 30 km (i.e., the distance from the source to Toppenish) is presented to determine whether the impacts from the source could possibly significantly contribute to the air quality issues in Toppenish. For the purposes of this analysis, I relied on the interim SIL for 24-hour $PM_{2.5}$ of 1.2 $\mu g/m^3$.

Table 3. Screening modeling 24-hour $PM_{2.5}$ concentrations ($\mu g/m^3$)

	Dryer 1	Boiler 1
White Swan impacts		
Maximum direct near-field impacts	9.3	28.0
Near-field background levels	21.9	21.9
Cumulative near-field impacts	31.2	49.9
Toppenish Impacts		
Impacts at 30 km	0.81	0.34

The screening results indicate that neither the single dryer without baghouse nor the wood boiler significantly contributes to air quality impacts at Toppenish for direct $PM_{2.5}$ emissions. As these emissions sources are by far the highest release height sources of all emission units at the proposed facility, and each represents a significant share of total proposed facility emissions (Dryer 1 is ~74% of Phase I $PM_{2.5}$ emissions; Boiler 1 is ~47% of Phase III $PM_{2.5}$ emissions), this screening is sufficiently representative of far-field $PM_{2.5}$ impacts of the source for each phase of operation. For additional confidence, dividing the impacts by the individual source's share of $PM_{2.5}$ emissions from the source (e.g., for Dryer 1, 0.81/0.74), we derive maximum potential impacts assuming all emissions from the facility would reach Toppenish as the highest release height from the facility. For Dryer 1, the highest potential impacts using this approach are 1.09 $\mu g/m^3$; for Boiler 1, they are 0.72 $\mu g/m^3$. Both values are below the significance threshold of 1.2 $\mu g/m^3$.

Near-field impacts from the proposed facility based on the screening modeling indicated that operations under Phase I would not result in a potential for exceedance of the NAAQS. Dryer 1 direct impacts for $PM_{2.5}$ were 9.3 $\mu g/m^3$, and when background levels were considered, total concentrations are 31.2 $\mu g/m^3$. When scaling direct impacts in a manner consistent with the approach described in the previous paragraph (e.g., for Dryer 1, 9.3/0.74), direct impacts become 12.6 $\mu g/m^3$ and cumulative impacts from the screening are 34.5 $\mu g/m^3$, which is below the NAAQS of 35 $\mu g/m^3$. However, screening results do indicate the potential for an exceedance of the NAAQS in the near-field from direct $PM_{2.5}$ emissions from Boiler 1, with direct impacts of 28.0 $\mu g/m^3$ resulting in cumulative impacts of 49.9 $\mu g/m^3$.

Qualitative analysis of secondary impacts on $PM_{2.5}$

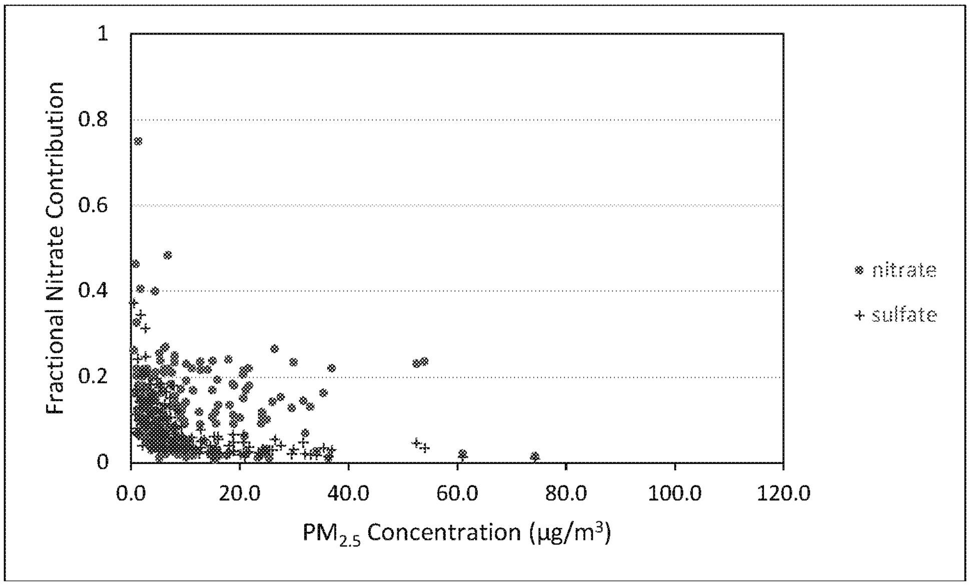
As described earlier, emissions of NOx are of particular concern in this region. Significantly, emissions of NOx may lead to formation of nitrate particulate matter, exacerbating the current air quality problems in the Yakima Valley. Full scale operation (i.e., Phase III) operation at the proposed source would result in an additional 101.3 tons per year NOx emissions from White Swan into the Yakima Valley. Therefore, additional analysis of the potential secondary impacts on $PM_{2.5}$ is warranted, consistent with (but not prescribed by) the requirements described Section III.2.1 (Qualitative Assessments) of the May 20, 2014 EPA Guidance for $PM_{2.5}$ Permit Modeling.

The 2011 National Emissions Inventory[1] indicates that annual NOx emissions in 2011 in Yakima County were 8,904 tons. Of that total, 6,352 tons were from on-road mobile sources, with another 978 tons from non-road mobile sources. An additional 101.3 tons of NOx emissions would account for an additional 1.14% increase in overall emissions in the county.

Examination of nitrate contribution to $PM_{2.5}$ in the Yakima Valley from January 1, 2012 through August 31, 2015 indicates that nitrate accounts for 0% to ~25% of overall $PM_{2.5}$ on days with high concentrations, as shown in Figure 3. Conservatively, we can assume that the current nitrate fraction would increase proportionally with the increase in NOx concentrations assuming full conversion into nitrate. Assuming background levels in White Swan of 21.9 $\mu g/m^3$ as a baseline, the resulting increase would be an additional 0.06 $\mu g/m^3$. This level of increase is not significant, and it is my judgment that the discussion here will suffice as a demonstration that secondary impacts from NOx need not be included in an AQIA.

[1] http://www.epa.gov/air-emissions-inventories/2011-national-emissions-inventory-nei-data

Figure 3. Fractional contribution of nitrate and sulfate to $PM_{2.5}$ as a Function of $PM_{2.5}$ Concentration



Source: EPA AQS DataMart (https://aqs.epa.gov/api)

The additional 15.3 tons per year of SO_2 from operation of the oil boilers may also have the potential to contribute to secondary formation of $PM_{2.5}$ as sulfate. Current sulfate levels in $PM_{2.5}$ are low at relevant concentrations, only around 5% of overall $PM_{2.5}$. 2011 emissions in Yakima County only totaled 192.6 tons per year. Therefore, the additional 15.3 tons represents an increase of approximately 7.9% over prior emission levels, which may have the potential to increase $PM_{2.5}$ concentrations from sulfate by around 0.09 $\mu g/m^3$, assuming that the air in the valley is well mixed. This value is well below the significance threshold for potential impacts for $PM_{2.5}$ from sulfate. This qualitative analysis indicates that the impacts will be from SO_2 emissions based on the use of low sulfur fuel included in the permit application.

Provisions for testing

It is my understanding that the applicant has expressed interest in testing the wood boiler during Phase I operation to achieve a lower permitted emission rate for the wood boiler. My analysis of the background air quality data in White Swan, where the wood boiler has the highest impacts according to my screening modeling, indicates that the optimal period for testing would be during Q2 (i.e., April through June). In those months, the background concentration is 8.5 $\mu g/m^3$ (calculated as per the May 20, 2014 EPA Guidance for $PM_{2.5}$ Permit Modeling), which would allow direct impacts from the facility for testing only to be at or less than the NAAQS of 35 $\mu g/m^3$ provided that emissions from the wood boiler are no greater than 1.63 lb/hr. I derived this allowed emission rate by multiplying the emission rate used in the screening modeling (~2.65 lb/hr) by the ratio of allowed impacts (NAAQS of 35 $\mu g/m^3$ - background of 8.5 $\mu g/m^3$ - modeled impacts from dryer 1 emissions of 9.3 $\mu g/m^3$ = 17.2 $\mu g/m^3$) to modeled direct impacts (28.0 $\mu g/m^3$); that is:

$$2.65 \text{ lb/hr} \times \frac{17.2\ \mu g/m^3}{28.0\ \mu g/m^3} = 1.63 \text{ lb/hr}$$

This emission limit is conservative as it includes all major emission sources from the proposed facility, and is therefore protective of the NAAQS. Testing during all other months is not advised, based on the background air quality data. If the wood boiler test results are at or below 1.23 lb/hr, based on the results of the screening modeling and an equation similar to the one above, that and the screening analysis described in this memorandum would constitute a sufficient justification that no violation of the 24-hour NAAQS would arise from operation of the wood boiler; i.e., no AQIA would be needed to before Phase II/III operations could proceed if the wood boiler test results suggest an emission rate at or below 1.23 lb/hr. However, if the test results are greater than 1.23 lb/hr, an AQIA would be required prior to Phase II/III operations.

Conclusion

These results of this analysis indicate the following:

- No additional modeling analysis is required to begin Phase I operations with low sulfur fuel.
- Prior to beginning of Phase II or Phase III operations (i.e., use of the wood boiler, Boiler 1), the applicant must satisfy one of the following requirements:
    1. The applicant must submit an AQIA that demonstrates that direct facility emissions of $PM_{2.5}$ on the surrounding area will not cause or contribute to a violation of the 24-hour $PM_{2.5}$ NAAQS. The AQIA must include an adequate qualitative analysis demonstrating that use of higher sulfur fuels will not cause or contribute to a violation of the 24-hour $PM_{2.5}$ NAAQS in order for the applicant to be allowed to burn higher sulfur fuels. (If the applicant chooses this option, I will provide additional information detailing the specific technical details that should be included in an AQIA beyond the broad requirement to include an AQIA consistent with the process outlined in 40 CFR Part 51 Appendix W.)
    2. The applicant must submit test results for the wood boiler (Boiler 1) demonstrating enforceable emission rates at or below 1.23 lb/hr. Such testing may occur only during April, May, or June, and the emission rate while operating must not exceed 1.63 lb/hr.

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Permit Analysis

Appendix C: Control Technology Review

Minor New Source Review Permit

Neucor, Incorporated

Yakama Reservation
White Swan, Washington

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
IDAHO OPERATIONS OFFICE
950 West Bannock, Suite 900
Boise, Idaho 83702

March 11, 2016

MEMORANDUM

SUBJECT: Neucor Minor NSR Control Technology Review

FROM: Doug Hardesty, Environmental Engineer
Air Permits and Diesel Unit, Office of Air, Toxics and Waste

TO: Neucor mNSR Project File

I performed the control technology review for the Neucor minor NSR permitting action. My analysis is described in this memorandum.

Background

On August 17, 2015, EPA Region 10 received an application from Neucor requesting authorization to construct a new source and requesting synthetic minor limits on HAPs. The application was determined incomplete on October 2, 2015. After receiving additional information, Region requested a new application more accurately reflecting Neucor's proposal. A new application was submitted on January 29, 2016.

Neucor is proposing to reactivate a MDF-manufacturing facility formerly owned and operated by Jeld-Wen, Inc., that was shut down in 2009. Region 10 determined that the reactivation was subject to permitting as a new source. EPA also determined that the equipment that was previously subject to the Plywood and Composite Wood Products Maximum Achievable Control Technology standard, 40 CFR Part 63, Subpart DDDD, remains subject to that MACT standard under EPA's Once-in-Always-in Policy notwithstanding the 2009 shutdown of the facility. See Memorandum from John Seitz, Director, Office of Air Quality Planning and Standards, Potential to Emit for MACT Standards—Guidance on Timing Issues, May 16, 1995. Neucor's request for synthetic minor limits on HAPs will allow the facility to be treated as a minor HAP source for future MACT standards.

The Neucor facility is made up of two identical production lines that can operate independent of each other and produce medium density fiberboard panels. The plant will be reactivated in three stages. In Stage 1, only line 1 will operate, the line 1 dryer will be uncontrolled and the wood-fired boiler (BLR1) will not operate. If certain permit conditions are met, in Stages 2 and 3, all emission units will operate and the dryers will be controlled by baghouses.

Control Technology Review Requirement

Tribal minor new source review, in 40 CFR 49.154(c) requires a case-by-case control technology review be determine the appropriate level of control, if any, necessary to assure the NAAQS are achieved, as well as the corresponding emissions limitations for the affected emission units. In carrying out the case-by-case control technology review, as specified in 49.145(c)(1) the reviewing authority must consider the following factors:

1. Local air quality conditions;
2. Typical control technology or other emission reduction measures used by similar sources in surrounding areas;
3. Anticipated economic growth in the area; and
4. Cost-effective emission reduction alternatives.

In addition, as required in 40 C.F.R. § 49.154(c)(2) through (5), the following criteria also applies to the emission limitations:

5. The reviewing authority must require a numerical limit on the quantity, rate or concentration of emissions for each regulated NSR pollutant emitted by each affected emissions unit, for which such a limit is technically and economically feasible.
6. Where a numeric limit is not feasible and where also necessary, the emission limitation required may consist of pollution prevention techniques, design standards, equipment standards, work practices, operational standards, requirements related to the operation or maintenance of the source or any combination thereof.
7. The emission limitations must assure that each affected emission unit will comply with all requirements of 40 CFR parts 60, 61, and 63, as well as any federal or tribal implementation plans that apply to the unit.
8. The emission limitations required may not rely on a stack height that exceeds good engineering practice or any other dispersion technique, except as allowed by 40 CFR 51.118(b).

Facility Description

The Neucor facility is located in White Swan, Washington, within the exterior boundaries of the 1855 Yakama Reservation and is in Indian Country as defined in 40 CFR Part 49. Neucor, a privately owned company and the facility operator, is leasing the facility from White Swan Manufacturing, LLC, which is owned by West Mountain View International, LLC, except for the two press lines that are being leased from Jeld-Wen.

Neucor plans to purchase wood chips and shavings from which it will produce panel cores manufactured using a dry-process MDF process. Neucor will manufacture hot-pressed panel cores in a variety of panel depths. Unprocessed (raw) wood furnish is received from trailers at the facility's truck dump. Furnish received at the truck dump is screened for size to remove large pieces of wood and debris that cannot be used in the process. Acceptable furnish is carried by auger and bucket elevator and distributed to three large raw material storage silos. One silo will contain dry shavings, one will contain green chips and the third will contain recycled material. This will facilitate the operating strategy described in Section 4 of this document. Furnish from the raw material storage silos is further screened prior to refining into optimum fiber size. Undersized material is rejected and pneumatically transferred to the waste truck bin for use off-site

Acceptable furnish is refined in a thermo-mechanical refiner. Emulsified wax will be added to the fiber as it exits the refiner to add water resistance to the core panel. After refining, the fiber is dried to 10-14% moisture content in a steam-heated tube dryer and stored in a fiber bin. Fiber from the bin is metered to a mechanical blender where methylene diphenyl diisocyanate (pMDI) resin is added and mixed with the fiber. Fiber mats are formed through a single-head vacuum forming line, then stacked into a loader and loaded into a multi-platen hot press. Once all platens of the press are full, the press forces the resinated fiber into molds under heat and pressure. Core panels will be pressed to a density of approximately 45-50 pounds per cubic foot and an average board thickness of 0.135". After the resin in the panel has fully cured, the press opens and the core panels are unloaded. Panels are visually inspected and sorted according to their depth and pattern orientation. Defective panel cores are hogged for reuse as raw material or sent to the waste truck bin for offsite use. Acceptable panel cores will be trimmed to a final size in a two-pass saw. Waste from the saw will be pneumatically conveyed to baghouses, and then to the raw material bins. Core panels will then be sanded to a specified depth on a two-head sander. Sander dust will be pneumatically transferred to the waste truck bin cyclone and bin for off-site use.

The air pollution emission units and control devices that exist at Neucor are listed and described in Table 1. As mentioned above, there are two identical production lines that can operate independent of each other. All refiner material and exhaust feeds directly into the dryer. Material handling, sanding and sawing activities have been separated into emission units based upon the shared control devices. When only production line 1 is operating, the sander is the only operating activity in emission unit MR2S.

Table 1: Emission Units and Control Devices

EU ID	Emission Unit Description	Proposed Control Device
BLR1 - Wood-Fired Boiler #1	Wellons brand, 47.3 MMBtu/hr, wood waste fuel; installed 1984	Wellons brand multiclone and electrostatic precipitator
BLR2 - Fuel Oil-Fired Boiler #2	Donlee brand, 37.8 MMBtu/hr, No. 2 diesel; installed 1997	None
BLR3 - Fuel Oil-Fired Boiler #3	Cleaver Brooks brand, 8.4 MMBtu/hr, No. 2 diesel fuel; installed 2005	None
D1 & D2 - Dryers #1 and #2	Refiners and indirectly steam heated Westec brand dryers on lines 1 and 2; 70 ODT/day each	None for stage 1; baghouses D1 and D2 for stages 2 and 3.
LF1 & LF2 - Blenders/Formers #1 and #2	Blenders and COE brand vacuum line formers on lines 1 and 2	Carter Day brand, model 156 RF10 baghouses F1 and F2, respectively
P1 & P2 - Presses #1 and #2	Washington Iron Works brand board presses for lines 1 and 2; 53.3 msf/day 3/4" basis each	None
C1 & C2 - Board Coolers #1 and #2	Board coolers for lines 1 and 2	None
MHS - Material Handling & Sawing	Material handling to the raw material silos, truck bin cyclone, fines cyclone, plug feeder cyclones (lines 1 & 2) and from the two-pass saw	Carter Day brand, model 375 RF10 baghouse BHS
MR1 - Material Recycling Line 1	Material handling to chip bin cyclone (line 1) and recycle cyclone (line 1)	Clarks brand, model 57-20 baghouse BH1
MR2S - Material Recycling Line 2 and Sanding	Material handling to recycle cyclone (line 2) and from the sander; when only line 1 is	Clarks brand, model 57-20 baghouse BH2

EU ID	Emission Unit Description	Proposed Control Device
	operating only the sander in this unit operates	
MNFA - Miscellaneous Non-Fugitive Activities	Miscellaneous non-fugitive activities generate emissions inside buildings and are not specifically described in other emission units	Inside buildings and partial buildings; the three-walled truck dump has a panel filter to collect and control dust
MFA - Miscellaneous Fugitive Activities	Miscellaneous fugitive activities generate emissions outside buildings and are not specifically described in other emission units.	None
DT - Diesel Tank	No. 2 diesel fuel storage; 10,000 gallons	None
FP - Fire Pump Engine	Detroit Diesel brand, model 6061A (671); 188 horsepower at 1750 rpm; 11.5 gallons/hour diesel fuel; 1.495 mmBtu/hr	None
PT - Plant Traffic	Plant traffic by vehicles on paved and unpaved roads generate fugitive dust emissions.	None

Affected Emission Units

Based on the Region 10's Emissions Evaluation of the Neucor application (Appendix A to the Permit Analysis), Tables 2 and 3 present (for Stage 1 and Stage 2/3 combined, respectively) the PTE for each emission unit that emits a regulated NSR pollutant that will be emitted (by the entire plant during Stage 3 operation) at levels above the mNSR applicability thresholds.

Table 2 - Stage 1 Potential to Emit, tons per year

Emission Unit	CO	NOx	PM	PM10	PM2.5	SO2	VOC
BLR2	5.8	23.2	2.3	3.8	3.8	8.2	0.2
BLR3	1.3	5.3	0.5	0.9	0.9	1.9	0.1
D1	1.4		46.5	43	26.8		26.6
F1			0.003	0.003	0.003		7.0
P1	0.4	0.3	1.8	3.4	3.4		2.9
C1			0.5	0.1	0.1		1.5
MHS (line 1)			0.2	0.2	0.2		7.8
MR1			0.00002	0.00002	0.00002		0.5
MR2S (line 1)			0.1	0.1	0.1		0.6
FP	0.1	0.3				0.03	0.02
Total	9.0	29.1	51.8	51.5	35.3	10.1	58.4

Table 3 - Stages 2 & 3 Potential to Emit, tons per year

Emission Unit	CO	NOx	PM	PM10	PM2.5	SO2	VOC
BLR1	124.0	72.5	8.1	11.6	11.6	5.2	3.5
BLR2	5.8	23.2	2.3	3.8	3.8	8.2	0.2
BLR3	1.3	5.3	0.5	0.9	0.9	1.9	0.1
D1	1.4		0.5	0.5	0.5		26.6
D2	1.4		0.5	0.5	0.5		26.6
F1			0.003	0.003	0.003		7.0
F2			0.003	0.003	0.003		7.0
P1	0.4	0.3	1.8	3.4	3.4		2.9
P2	0.4	0.3	1.8	3.4	3.4		2.9
C1			0.5	0.1	0.1		1.5
C2			0.5	0.1	0.1		1.5
MHS (line 1)			0.2	0.2	0.2		7.8
MHS (line 2)			0.2	0.2	0.2		7.8
MR1			0.00002	0.00002	0.00002		0.5
MR2S (line 1)			0.1	0.1	0.1		0.6
MR2S			0.5	0.5	0.5		1.1
FP	0.1	0.3				0.03	0.02
Total	134.7	101.9	17.4	25.2	25.2	15.3	119.3

Evaluation

1. Local air quality conditions. The primary concern regarding local air quality has been high PM2.5 levels during stagnant periods. To decide whether to require an air quality impact analysis, Region 10 performed a screening analysis for PM2.5 impacts. The analysis (see Appendix B of the Permit Analysis), which assumed baghouses would control emissions from refiner/dryer emissions, concluded that there is no concern about PM2.5 impacts until Stages 2 and 3, when the wood-fired boiler BLR1 is operating. To address that, the permit should require baghouses on the refiner/dryer emissions and a full AQIA before allowing dryer D2 and BLR1 to operate (See Permit Conditions 3.1 and 3.2). In Stages 2/3, BLR1 will emit 46% of the PM2.5 emissions from the plant, the presses will emit 27% and BLR2 will emit 15%. If the AQIA indicates that additional PM2.5 reductions are warranted, Region 10 and Neucor will have to reconsider whether controls for those three emission units will be needed. The permit should also limit the sulfur content of fuel oil used at the plant, which will limit the impact on PM2.5 ambient levels caused by sulfates (see Permit Condition 3.5). Given that there are no other NAAQS that are currently a concern, no other control options to address local air quality concerns have been identified.

2. Typical control technology or other emission reduction measures used by similar sources in surrounding areas. Region 10 identified three permits issued to facilities located in Region 10; two produce MDF products, the third is a sawmill with a wood-fired boiler. While there are some differences in the operating techniques between the MDF facilities, the controls used at each facility can be considered for application to the Neucor facility. Neucor has agreed to put baghouses, which are the best controls available, on several emission units; therefore, the analysis will not focus on those emission units. This comparison will focus only on combustion devices, refiners/dryers, formers (except PM),

presses and board coolers. A summary of the emission controls and emission limits at those facilities is in Table 4.

Table 3 - Stages 2 & 3 Potential to Emit, tons per year

Emission Unit	Pollutant	Limitation
SDS Lumber Company, Bingen, WA – WDOE Air Operating Permit No. 13AQ-C181 (sawmill with wood-fired boiler)		
All units	PM	Opacity 20%
	Fugitives	Reasonable precautions
	SO2	1000 ppm
Combustion units	PM	0.1 gr/dscf (does not apply to wood-fired units)
Process units	PM	0.1 gr/dscf
Wood-fired boiler	PM	0.04 gr/dscf at 7% O2 and 14pph
		Opacity 10%
	All	Good O&M
	Control = dry ESP	
Jeld-Wen Inc, Klamath Falls, OR – ODEQ Title V Operating Permit		
Dryers/presses	PM	Opacity 20%
		0.1 gr/dscf
	HAP	90% formaldehyde reduction using add-on controls
	Control = baghouse/biofilter	
Wood-fired boiler	PM	Opacity 20%
		0.07 gr/dscf at 12% O2 (multiclone/ESP)
Flakeboard America Limited, Eugene OR – LRAPA Title V Operating Permit		
Refiner/dryer	PM	0.1 gr/dscf
		Opacity 20%
	Formaldehyde	Reduce by 90%
	Control = wet ESP, baghouse, biofilter	
Press	PM	Opacity 20%
		0.1 gr/dscf
	Formaldehyde	Reduce by 90%
	VOC EF	0.246 lb/msf ¾"
	Control = biofilter (also on refiner/dryer)	

The general requirement for opacity and reasonable precautions for fugitives in the SDS Lumber permit are typical of the northwest. Those limits are on par with the limits recommended for the Neucor permit.

The general combustion source requirements are also very similar to the Neucor limits. The SDS Lumber wood-fired boiler has a tighter opacity and a fairly tight grain loading. Converting Neucor's proposed production-based limit to a grain loading limit (0.039 x 0.2 / 0.412) based on the assumptions used in Region 10's Emissions Evaluation in Appendix A, results in 0.02 gr/dscf, which is more stringent than the limit in SDS Lumber. When Neucor tests BLR1, opacity will be measured as well. The Title V permit will likely be able to tie actual opacity closer to the grain loading limit through the application of periodic monitoring or compliance assurance monitoring. The resulting opacity that Neucor will have to track in that case will likely be much lower than 20%.

The most important difference between the comparison permits and Neucor is the controls on the dryers and presses. Obviously, those add-on controls were mandated to comply with the PCWP MACT. If the operational adjustments Neucor is planning to make allow them to comply with the production-based limits in the MACT, they will not have to install add-on controls to meet the more stringent compliance limit in the MACT (e.g. a 90% reduction).

The mNSR permit should include an opacity limit of 20% (see Permit Condition 3.13), good operation and maintenance (see Permit Condition 3.9), reasonable precautions to prevent fugitives (see Permit Condition 3.14), production-based emissions limits that reflect compliance with applicable requirements that exceed 0.1 gr/dscf and 0.02 gr/dscf for BLR1 (see Permit Condition 3.6).

3. Anticipated economic growth in the area. Growth in the area is not expected to increase significantly in the foreseeable future. As discussed in Region 10's air quality assessment in Appendix B, a local air quality agency is spearheading PM2.5 emission reductions strategies that may keep the area from becoming nonattainment. That effort will have to consider future growth. Given that the limits that will be set in the permit address the known PM2.5 air quality concerns and significant growth is not anticipated, no other control options have been identified.

4. Cost-effective emission reduction alternatives. By examining control techniques used at other similar facilities, available cost-effective add-on control techniques should have been identified and evaluated. Other emission reduction techniques can be required in the permit to address fugitive emissions and equipment maintenance. Routine plant walk-though inspection to identify equipment and operational issues is a very cost-effective technique for assuring emissions are reduced. Many of the techniques that will be required by the permit have come from current operating permits, reflecting the latest approaches for keeping emission low. The permit should require standard fugitive dust reduction techniques (see Permit Condition 3.14).

5. The reviewing authority must require a numerical limit on the quantity, rate or concentration of emissions for each regulated NSR pollutant emitted by each affected emissions unit, for which such a limit is technically and economically feasible. Region 10's Emissions Evaluation in Appendix A of the Permit Analysis documented potential emission of each regulated air pollutant based on the capacity of each emission unit. In doing so, emission factors that reflect the controls and applicable requirements were established in the emission inventory. The emission factors for non-fugitive emission units should be considered technically feasible because they can be tracked and reasonably measured if necessary. Given that these limits reflect Neucor's proposal in their application, they should also be considered economically feasible. The non-fugitive emission factors established in the PTE evaluation should serve as production-based emission limits in the permit (see Permit Condition 3.6). Other numerical limitations that were relied upon to establish the production-based emission limits, should also be set in the permit. These include limits on operating capacity (see Permit Condition 3.7), limits on visible emissions (see Permit Condition 3.13), limits on the sulfur content of fuel oil (see Permit Condition 3.5), limits on the hours the fire pump engine can operate (see Permit Condition 3.11, limits on furnish moisture content, furnish drying and pressing temperatures and resin formaldehyde content (see Permit Condition 3.12).

6. Where a numeric limit is not feasible and where also necessary, the emission limitation required may consist of pollution prevention techniques, design standards, equipment standards, work practices, operational standards, requirements related to the operation or maintenance of the source or any combination thereof. In addition to the numerical limits described above, the permit should include non-

numerical limits for fugitive emissions and other work practices. Consistent with the assumptions made in evaluating the emission from the plant, the permit should also require good air pollution control practices for minimizing emissions (see Permit Condition 3.9), restrict the fuel types that can be combusted in the wood-fired boiler to only (wood) hogged fuel (see Permit Condition 3.10) and require reasonable precautions be taken regarding fugitive emissions (see Permit Condition 3.14).

7. The emission limitations must assure that each affected emission unit will comply with all requirements of 40 CFR parts 60, 61, and 63, as well as any federal or tribal implementation plans (e.g. the FARR in 40 CFR 49.121-139) that apply to the unit. Region 10's Emissions Evaluation in Appendix A of the Permit Analysis documented potential emission of each regulated air pollutant considering all of the applicable requirements that apply to each emission unit. Those applicable requirements include the NSPS subpart Dc (40 CFR Part 60), the FARR (40 CFR 49.121-137), and the PCWP MACT (40 CFR Part 63, Subpart DDDD).

The NSPS only applies to the oil-fired BLR2 and includes a visible emission limit (opacity) of 20% [60.43c(C)] and a fuel oil sulfur content limit of 0.5% [60.42c(d)]. There is no reason to believe BLR2 will have any problem meeting the NSPS visible emission limit. The permit should include a 20% visible emission limit (See permit Condition 3.13). To protect air quality, the permit should limit fuel oil sulfur content to 0.05% (see Permit Condition 3.5), which goes beyond the NSPS.

The FARR includes a visible emission limit of 20% that applies to all emission units [49.124(d)(1)], particulate limits that apply differently to combustion and process emission units, fugitive emission requirements (49.126), sulfur dioxide limits (49.129) and sulfur in fuel limits that apply different to different fuel types. As mentioned above regarding the NSPS visible emission limit, the permit should include a 20% limit (see Permit Condition 3.13). The permit also should include the fugitive emission restrictions (see Permit Condition 3.14). The particulate limits include 0.1 gr/dscf [49.125(d)(1)] that apply to BLR2, BLR3 and FP; 0.2 gr/dscf [49.125(d)(2)] that applies to BLR1; and 0.1 gr/dscf [49.125(d)(3) that applies to process units. All of these limits have been considered in creating emission factors and estimating potential to emit.

The PCWP MACT has three types of emission limits: production-based, add-on control systems and emission averaging. Neucor proposes to comply with the production-based compliance option which limits HAP emissions to 0.039 and 0.26 lb/ODT from the refiners and dryers, respectively, and to 0.30 lb/msf ¾" from the presses. Because the refiners and dryers vent through the same system, the limit from the combined emission unit is 0.299 lb/ODT. The HAP limited by the MACT are also VOCs, so the limitations in the mNSR permit must assure compliance.

The plant operator prior to Neucor also manufactured MDF. Before stopping operations in 2009, that operator tested the HAP emissions. Measured emissions were well above the production-based limits. Nuecor's application explains that their product is different than the previous operator, such that they can use a different raw material and run the plant differently, resulting is lower emissions. Specifically, Neucor plans to use furnish with a lower moisture content, lower the operating temperatures of the dryers and presses and produce a final product with a higher moisture content.

It is common knowledge in the wood products industry that higher drying and pressing temperatures and longer drying times (necessary for a larger moisture change) increase HAP and VOC emissions. Data that demonstrates how much these operating parameters impact emissions is not available. Region 10 has established a temperature threshold for lumber drying kilns such that drying above that temperature much higher emission factors must be used to estimate emissions. Region 10 has not established a temperature threshold for furnish dryers and presses. Neucor has assured Region 10 that it can comply with the production-based HAP limits in the MACT without installing additional controls. Neucor will be required to demonstrate compliance with the MACT within 180 days after beginning operation, consistent with the requirements of the PCWP MACT. Assuming that testing demonstrates compliance, operational parameters recorded during the testing will become restrictions according to the MACT.

The PCWP MACT was considered in the analyses of the Neucor application, but this mNSR permit is not intended to implement the PCWP MACT standard. As provided in 40 C.F.R. 49.154(c)(4), it is intended to assure that the VOC emission limit is consistent with the requirements of the PCWP MACT. The potential to emit estimation and resulting emission limits for VOC are appropriately based on compliance with the production-based limit in the MACT (see Permit Conditions 3.6). The HAP emissions from the press are assumed to contribute nearly 100% of the VOC emissions. The HAP emissions from the refiners/dryers are assumed to make up only 14% of the VOC emission limit. Non-compliance with the MACT will clearly indicate non-compliance with the VOC emission limit on the press.

8. <u>The emission limitations required may not rely on a stack height that exceeds good engineering practice or any other dispersion technique, except as allowed by 40 CFR 51.118(b).</u> None of the limitations rely on stack heights that exceed good engineering practices.